

**THE BOOK OF
GENERAL
KNOWLEDGE**

MARTIN

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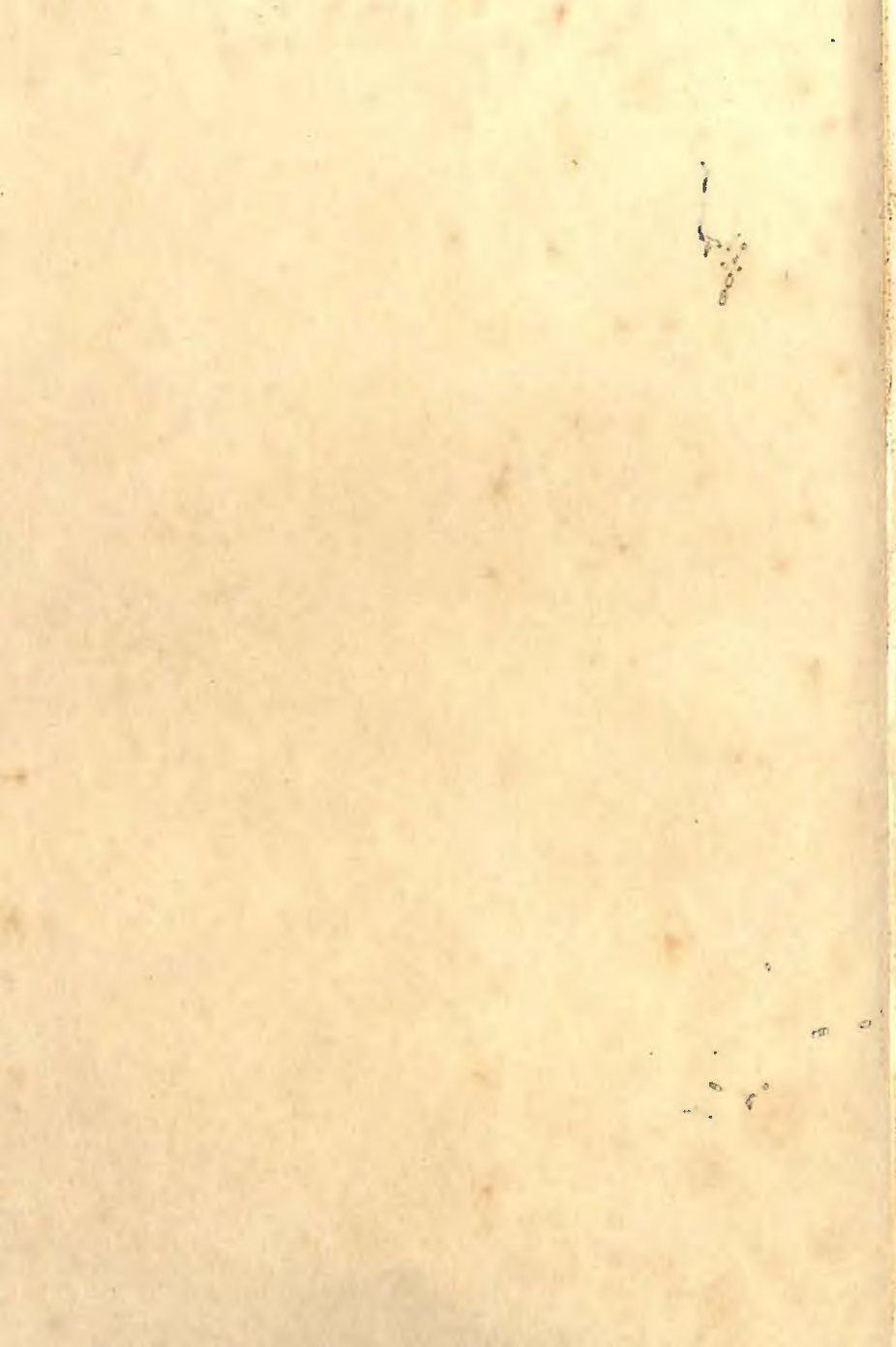
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*The Book of
General Knowledge*

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THE BOOK OF GENERAL KNOWLEDGE

BY

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THE ENGLISH UNIVERSITIES PRESS LTD.
LONDON

FIRST PUBLISHED	1938
SECOND EDITION	1939
REPRINTED	.	.	.	.	.	1943
THIRD EDITION	1946
REPRINTED	1948
FOURTH EDITION	1949

LIBRARY OF THE UNIVERSITY OF
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PRINTED AND BOUND IN ENGLAND
 FOR THE ENGLISH UNIVERSITIES PRESS, LTD.,
 BY HAZELL, WATSON AND VINEY LTD., AYLESBURY

FOREWORD

GENERAL Knowledge is as wide as the Universe, and ultimately embraces all knowledge. For this reason the subject seems at first sight so vast and vague and formless as to defy any attempt to master it. It is none the less possible to confine General Knowledge within certain limits and to give it a definite outline. Within these limits and this outline the subject can be mastered by the general reader as well as by the examination student.

The author wishes to acknowledge with thanks the courtesy and assistance afforded to him by the Lincoln Electric Company of Cleveland, Ohio, in producing the text and illustrations dealing with Electric Arc Welding.

The author has analysed and classified questions asked in General Knowledge papers over a long period, and has endeavoured to produce a book, the reading of which would not only satisfy the general reader, but would also equip candidates for the various examinations which include this subject in their syllabus.

It is indeed a tribute to the reasonableness of General Knowledge examination papers that it may be claimed for this book that its contents are of general interest and of fundamental importance.

A number of examination questions, the majority of which have been set at various times in Civil Service and Professional examinations, will be found at the end of each Part of the book. Not all the questions are specifically answered in the text. The student is advised to work out the answers for himself by reference where necessary to the bibliography at the end of each Part.

A list of Professional examinations which include this subject in their syllabus will be found in the Appendix.

R. R. M.

ACKNOWLEDGMENTS

THE author wishes to express his thanks to Mr. Julian S. Huxley, M.A., D.Sc., for his kindness in revising the chapter on Scientific Research and Human Life; to the late Mr. Frank Rutter and Mr. T. E. Tallmadge for the inspiration derived from their works on Painting and Architecture respectively; and to Mr. H. S. Gordon for revising the manuscript and for his invaluable help in the compilation of the section on Music.

A number of self-explanatory illustrations will be found throughout the book without any corresponding commentary in the text; and the author's and publishers' acknowledgments for permission to reproduce these illustrations are due to: The Syndicate Publishing Co., Ltd.; Pictorial Education; Thos. Nelson & Sons, Ltd.; *The Motor*; Imperial Airways, Ltd.; and The Exclusive News Agency.

The author's and publishers' acknowledgments are also due to His Majesty's Stationery Office for permission to reproduce questions set in past Civil Service Examinations, and to Messrs. George Philip and Son, Ltd., for permission to reproduce three maps of Europe.

R. R. M.

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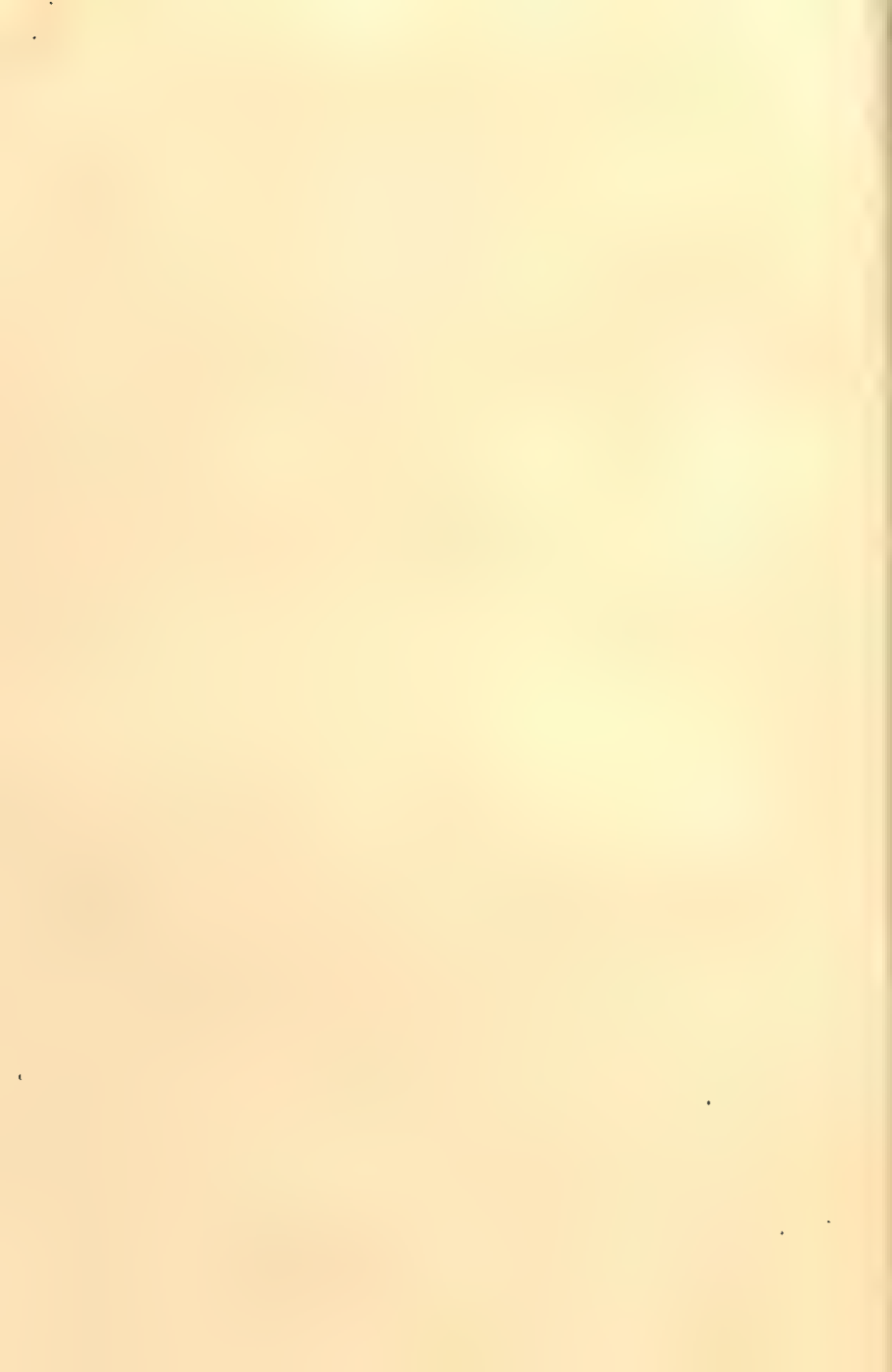
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PART I

HOW WE LIVE AND MOVE AND HAVE
OUR BEING



THE FIELD OF GENERAL KNOWLEDGE

Environment into which we are born	Action	Science	Practical Achievements	Spiritual Achievements of Mankind
Astrosphere { The Sun The Moon The Planets The Stars Inter-stellar space	{ Rotation of the Earth on its Axis Revolution of the Earth round the Sun Solar Heat and Light Tidal Influence of the Sun and Moon Electricity and Cosmic Rays	{ Astronomy Molecular Physics Radiology	{ Observatories Telescope Spectrum Radio Electric Light Electric Transport	
Atmosphere { Climate Spring Summer Autumn Winter	{ Arctic Temperate Tropical Sowing and Planting Sun Bathing Harvest Fires and Skating	{ Meteorology Inorganic Chemistry Aeronautics	{ Weather Forecast Aeroplane Air Conditioning	
Lithosphere { Mountains Valleys Plains	{ Mining Industry Farming	{ Geology Metallurgy Inorganic Chemistry	{ Discovery of Mineral Deposits Iron, Steel, etc. Industries Agricultural Instruments Dyes, Fertilisers, Medicine Petrol, Synthetic Products	Poetry Painting Sculpture Architecture Music Drama Literature Philosophy Religion
Hydrosphere { Sea Rivers Rain Wells	{ Navigation Irrigation Fishing Drinking	{ Inorganic Chemistry Physics	{ Steam Engine Hydraulic Power Ships Dams Drainage	
Biosphere { Animals Vegetables Trees Flowers Cereals Bacteria	{ Domestication Food Decoration Health and Disease	{ Biology Botany Zoology Bacteriology	{ Horse Breeding Cultivated Fruits and Vegetables Penicillin Insulin Antiseptics	
Psychosphere { Individuals Classes Nations Races	{ Personality Habits Customs Colour and Physique	{ Ethnology Anthropology Sociology Psychology	{ British Commonwealth of Nations U.S.A. U.S.S.R. Psycho-Therapy	
Time and Space { The Past The Present The Future The Shape of Things	{ Memory Perception Imagination Movement	{ Mathematics History	{ Measurement Wireless Science Radar Origin of Species	

CHAPTER I

METHOD IN ACQUIRING GENERAL KNOWLEDGE

*Purpose of the Book—Facts—Geographical Facts—
Economic Facts—Political Facts—The Mind and
Methods of Thought—Public Libraries.*

PURPOSE OF THE BOOK

THIS book is not an encyclopædia. Such facts as are given are brought in by way of illustration. Our purpose is to help the reader, who is striving to equip himself with General Knowledge, to approach this subject with a clear idea of what he is seeking to achieve. The writer has been told by many young people, who have been studying for the Civil Service or professional examinations where this subject is compulsory, that they experience a hopeless feeling when endeavouring to make up their minds as to the line of study to be pursued. This book is designed to remove that feeling.

The diagram headed "The field of General Knowledge" is not intended to be more than a suggestion and a stimulus to the student. It is obvious that in the brief space occupied it is not possible to attempt a comprehensive picture. A few examples only can be given in each column, and it is hoped that these will encourage the student to fill the gaps by using and extending his own knowledge.

The book is also intended to be of assistance to two other classes of students, viz. those who are in the final stages of their school education, and those who, amid the preoccupations of adult life, would like to improve their knowledge of the world around them and feel that their efforts in this

direction are leading them to some coherent view of life, and not to a picture crammed with all sorts of material apparently unconnected, and therefore without significance.

FACTS

Our purpose, therefore, is to indicate to the student certain lines of thought to be followed, and to help him to realise that these lines are interconnected in a significant way. Knowledge should be conceived as a pattern, and the various sections of which it is made up as significant parts of that pattern. If we realise the part played by any particular fact, or set of facts, in building up the pattern of knowledge as a whole, it at once becomes pregnant with meaning. It becomes understandable, and fits much more easily into the framework of memory. Using an analogy, it is more easily pigeon-holed; and the pigeon-holes themselves are more easily labelled, and divided up into sections, and the sections allocated to their appropriate divisions. This last analogy will be found useful. The student should ask himself concerning any particular fact, or set of facts: "Into what pigeon-hole am I going to put this when I have assimilated it?"

As indicated in the opening paragraph, it is impossible, within the limits of the following chapters, to cover the whole field of knowledge, but the facts introduced by way of illustration will point the way in which the student will continue his studies. He will be helped to avoid floundering about in a mass of unrelated fact, to exclude what is irrelevant, and to concentrate upon what alone is relevant.

GEOGRAPHICAL FACTS

To begin with, we have geographical facts: our natural surroundings, the place where we live, its place

on the map. In what part of the world is it situated? What is the character of that part of the world? Do we live on an island? On a continent? Do we live in the country or in a city? Is our home among the mountains, or in the valleys, or in the plains, on the banks of a river, or by the sea? What is the nature of the soil on which we are living? What, in fact, is our environment?

Geography is the description of the earth, and, viewed in its widest sense, should include all facts relating to our physical environment. Under this heading, therefore, will come such questions as the nature of the climate that we enjoy, as compared with that enjoyed by people living in other parts of the world. The effects of climate upon health, and upon the nature of the vegetation of the surrounding districts, and the fauna which inhabit them, and therefore the types of food which can be produced therein, will fall into this group.

On the foundations of these homely facts there has been built a mighty structure of science: the science of geography itself, the sciences of physics, chemistry, biology, botany, zoology are all built up from this group of facts. Another great science which might seem at first sight to be far removed from such homely things is the science of astronomy. But after all, this science arises from the contemplation of the sky at night time, and the sky is just as much a part of our environment as the soil on which we live. The great group of the physical sciences is the outcome of the study of our physical environment, and astronomy is a member of that group even though its researches have led our minds to the farthest confines of the stellar universe, and possibly even beyond.

ECONOMIC FACTS

The question, "How do we make a living?" brings us, as indicated above, to the economic aspect of things, and thus we are led to consider how we live, and move, and have our being. How is our food produced?

Where do we get the material for building our houses ? For making our clothes ? And, what means do we adopt for transporting these materials from the place where they are produced to the place where they are used ? From this we are led to consider the means by which the raw material produced from the soil is converted into manufactured goods; and then the question arises, How are these goods distributed ?

We now find ourselves led to a series of questions involving trade, commerce, banking and international finance. At this point such problems as those of currency, foreign exchanges, and the gold standard present themselves to be dealt with, and when we have disposed of those we find ourselves confronted with the great question of the organisation of international trade, and the whole future of modern industrial civilisation.

POLITICAL FACTS

The consideration of this interesting group of facts brings us to another group, which can be labelled *Political*. We will soon find that the problems which arise in the economic sphere are affected by a group of problems and facts known as political. Why is this ? In what way can politics affect the earning of a living by human beings ? The answer is that the human race is divided up into a large number of groups, which we describe as political units, and each unit makes its own laws, and compels everybody living within its borders to conform to those laws. We find that politics affect us not only as groups but as individuals. We are affected as individuals owing to the fact that it has been found necessary to entrust the performance of certain duties, affecting all of us, to what is known as a Government; and the question immediately arises, Why must we have a Government, and how does this business of government work ?

This leads us to the further question, How are other

people governed, and in what way do their Governments react upon ours, and how does our political group get along with them? Do we engage in commerce with them, and generally what are our relations with them? Thus we find ourselves enquiring into the nature of the Fascist system, Nazism and Bolshevism. We find the Western world falling in these days into two great groups, in one of which democratic ideas of government prevail, whilst in the other the people live under the rule of dictators. This leads us to a consideration of the difference between these two systems, and the comparison of our own system of government with those of the United States of America and others.

THE MIND

The foregoing facts are all things that happen in the world outside ourselves. In the world within ourselves the realities are our feelings and our thoughts. We find the modern world more and more preoccupied with this group of facts, and this is why education looms so large. The training of the mind is held to be of great importance nowadays, and there is much discussion and much hard thinking going on as to the best methods of training it. Education has become a science in itself—in fact, it has developed so far that it has sub-sciences of its own. It is closely related to the science of psychology, which is concerned with our thoughts and feelings and how they work, and the causes of their behaviour.

Closely connected with the last group are such subjects as industrial psychology, neurology, which concerns itself with the nervous disorders of mankind, and the celebrated modern method of dealing with nervous disorders known as psycho-analysis.

Our emotions, feelings and intellect find their outlet, at their best, in creative achievements, in literature, philosophy and art, and in human achievements of the practical kind which have altered the face of the world,

such as the building of cities and churches, and of other great edifices.

METHODS OF THOUGHT

When we are considering any particular item, such as Rationalisation, or Atoms, or Kew Gardens, our first thought should be: How does this fit into the scheme of things? How is it associated with other facts and systems of fact?

A well-informed person must be ready to answer questions concerning the great figures of literature, drama, science, philosophy, painting, sculpture, architecture and music. The world we live in has been greatly altered as the result of close and creative thinking, and we shall have to look around us and notice in what way our environment has been changed, and is being changed, by the activities of the scientists, engineers, sculptors, architects, statesmen, politicians and men of action, who base their action upon the ideas of the creative thinkers.

We shall find all around us the results of scientific research, which have profoundly modified our everyday life. We shall see the outward and visible manifestation of the intense thinking of the scientists in such familiar things as the pylons of the Grid, gas masks (alas!), wireless sets, telephones and a hundred and one other things. We shall learn that these investigators are profoundly affecting our lives in ways that are not conspicuous, but none the less real and immensely important.

Thus, the biologist, we shall discover, is silently and inconspicuously carrying on what is probably the greatest of all the wars in which the human race has ever been engaged: war against microscopic life and against the insects. The mathematician and physicist are pursuing researches which lead to constant advances in many directions, such as aeronautics and wireless communication, whilst the students of the human body are prolonging human life and increasing its happiness by achieving

greater and greater understanding of its constitution.

At this point such names occur to us as Einstein, Oliver Lodge, Marconi, Rutherford, Lister, M. and Mme Curie, Julian Huxley, J. B. S. Haldane, A. N. Whitehead, Eddington, Edison and Jeans.

The work of the engineers is not far to seek. We shall find it in the bridges, in the vast modern buildings, in the electric train services and the record-breaking locomotives and great ships. In modern times the architects work side by side with the engineers, and the sculptors help to adorn the buildings they erect.

Where shall we look for the work of the statesmen and politicians? We are, of course, only referring to the great statesmen and the effective politicians. The work of these people is not so obvious as that of the engineers and architects, but it is none the less real. Where they are doing work of real benefit to the community, we shall see it in such things as slum clearance, sanitation, State medical services and generally improved standards of life.

What do we mean by the men of action? We mean such men as organisers of industry, "big business men," trade union leaders, explorers and pioneers.

So it is that we shall find ourselves thinking of such men as Philip Snowden, in connexion with the financial crisis of 1931; of Montagu Norman in connexion with the Bank of England, and the financial dealings of Great Britain with foreign countries; of Henry Ford in connexion with mass production, and Lord Melchett with rationalisation; Sir Josiah Stamp, with railway organisation; and of the House of Rothschild in connexion with international finance.

Among the statesmen and politicians of all nations many prominent figures will come under our notice, such as Hitler, Goering, Goebbels, Von Neurath and Von Ribbentrop in Germany; Mussolini and Grandi in Italy; Stalin in Russia; Blum and Daladier in France; and Roosevelt and Cordell Hull in America.

When we come to the spheres of literature, philosophy and art, we shall find less outward and visible evidence of the modification of our lives effected by the great men in these spheres. This does not mean that their influence has been less pronounced and less profound. Their influence has been upon our minds and feelings, which ultimately are the most important things. When one considers the widespread influence in modern times of the printed word, it is easy to grasp how far-reaching can be the effect of a book. It must also be remembered that the writer, the artist and the philosopher exercise their influence upon the most highly educated people in the community, who in turn, through the various professions, have a lasting influence upon the organisation and running of a modern community.

It is hoped that the student after reading this chapter will make up his mind to find out for himself the names of the leading figures in the various branches of human achievement outlined above, and familiarise himself with their achievements.

PUBLIC LIBRARIES

Every student has at his disposal a Public Library, by the judicious use of which he equips himself with the essentials of General Knowledge.

The three Departments, the Lending Library, the Reference Library and the Reading Room, each and all have their special uses.

The method of classification in the Catalogue is itself a lesson in general knowledge, and the student should make himself familiar with it. An hour or so at frequent intervals in the Reference Room will steadily add to his store, and if he is systematic in his researches he will find there sources of information which are not ordinarily available to him elsewhere.

Part of this hour should also be devoted to the perusal of weekly and monthly periodicals.

CHAPTER II

THE WORLD IN THE HOME

Significance of Familiar Things—Psychology—Psychoanalysis—Freud—Inhibitions—Complexes—Objects in the Home—Furniture—Electricity—Steel—Wireless—Foodstuffs—Finance—Government—Law—Defence.

SIGNIFICANCE OF FAMILIAR THINGS

WHEN we go to see a play or a revue or a picture, the drama and the pageantry may satisfy us. We are content to look on—our attention may be held. Our worries, real and imaginary (usually imaginary), disappear, we forget them and are all the better equipped afterwards to face our troubles and tasks.

How much less irritable and harassed we should be every morning if we could be similarly entertained while going through the morning toilet ! If we only knew how to do it the whole business could be made astonishingly entertaining. How can this be done ?

By realising the full significance of what we are doing. We wake up. What does this mean ? It means that we have passed from the *unconscious* state to the *conscious*. Behind that commonplace everyday occurrence is the whole complicated mechanism of our minds and our bodies and the age-long processes of inorganic and organic evolution of which our bodies and our personalities are the latest outcome.

PSYCHOLOGY

Starting from such familiar facts as going to sleep and waking up, there has been built up the great science

of Psychology. The advance of this science is one of the greatest achievements of modern times, and may in the long run do more for the benefit of humanity than all the record-breaking flights of aeroplanes and all the peace conferences and propaganda.

Psychology has, of course, been a branch of knowledge ever since the days of Aristotle, i.e. for over 2,000 years. Until the beginning of the twentieth century, however, it remained stationary. It was regarded as a branch of philosophy and not a subject for scientific experiment and investigation. Then came Dr. Sigmund Freud, followed closely by Dr. Jung and Dr. Adler. These men made human consciousness, waking and sleeping (or as they prefer to describe it, the conscious and unconscious being of man) the subject of scientific investigation. They and their colleagues observed the behaviour of thousands of human beings, normal and abnormal, in trance and coma, waking, sleeping and dreaming.

As a result of a vast accumulation of data, it was discovered that the feelings, emotions, thoughts, acts, desires, hopes, fears, antipathies and sympathies of our conscious life are profoundly influenced by a subconscious life, which exists in each of us below the surface. This is popularly known as the *subconscious* self. In this subconscious self are stored up all our experiences from earliest childhood onwards as well as pre-natal experiences and even, in the opinion of some Psychologists, age-old racial experiences. These have a profound influence on our attitude to life and our reactions to our environment. Our ideals, our ambitions, our aims in life, the way we tackle life's problems, are affected by this hidden life of ours.

It is still a matter of controversy between Psychologists whether our whole life is thus influenced. Some say we are in this way *entirely* controlled. Others that there is something more in us than just these accumulations of experience; something which can, if it *will*, rise superior

to them and mould its own destiny. But all are agreed that the subconscious plays an exceedingly important part in our lives, and that the more we know about it, the more favourably placed we shall be to deal with the most difficult human problems, social and individual.

PSYCHO-ANALYSIS

The study of the subconscious has yielded wonderful results when applied to pathological, mental and nervous cases. A technique has been evolved for dealing with these cases psychologically, known as *Psycho-analysis*. This is now a necessary part of the equipment of every neurological specialist, and to some extent of every competent practitioner. The inventor of this method, the Austrian, Sigmund Freud, was a benefactor of humanity.

FREUD

Freud's theory is that most neurological disorders and many physical ones are due to some shock, suppression, or frustration in the patient's past life, possibly a long time ago during his or her infancy, setting up a complex and giving rise to mental and emotional states known as neuroses.

These states are usually produced by some form of repression: that is to say, some thwarted wish or desire. They still continue to work unconsciously, and, being unable to find the outlet that they sought, endeavour to effect egress in some other way.

Freud divided our conscious and unconscious life into two parts, one of which was dominated by what he called the *pleasure principle* and the other the *reality principle*.

The pleasure principle is accompanied by a desire to avoid painful and disagreeable impressions, and a desire for immediate gratifications of the instinct for pleasure in various forms. It is ego-centric and non-social. This

is the primitive part of our make-up. As we develop, the reality principle comes into play. It is the function of this principle to adapt the organism to its environment and it therefore in due course comes into conflict with the pleasure principle, which it endeavours to guide and control and adapt to circumstances.

INHIBITIONS

Many nervous troubles are due to the thwarting, or to use the scientific term, the inhibition of the pleasure principle. The tendencies classified under this heading strive to express themselves in our conscious life, i.e. to find an outlet in this way. They are repressed sometimes of necessity, because social and ethical considerations do not permit of their satisfaction; sometimes unnecessarily and for invalid reasons, such as the unreasonable tyranny of parents, relatives and others. The result is that these tendencies continue to lead a submerged life in our subconscious being but are constantly striving after the unobtainable. These tendencies are frequently repugnant to the feelings and ideals which a person has developed under the influence of the reality principle, so he or she suppresses them, and does not readily admit their existence.

It must be realised that these tendencies represent a form of vital energy, and if not allowed their natural outlet must find an outlet in some other direction, or else the energy which they represent will invade some sphere of our being where it is not welcome, and trouble ensues. This is the origin, says Freud, of neurotic symptoms. If these instincts can find an outlet in dreams, art, poetry, music, etc., all may be well. If, however, these avenues are not available to them they are apt to emerge either in the neurotic troubles referred to above, or in some anti-social way such as in vice, or crime or deceitfulness, or other objectionable ways.

These repressed processes become associated with thoughts and emotions and form a kind of constellation which is known as a complex, which gains an independent activity of its own, of which the individual is unaware. The purpose of Psycho-analysis is to bring these complexes within the sphere of consciousness and fuse them with the normal personality, thus bringing them under control. An endeavour is therefore made to work back from the symptoms to their cause, bringing that cause into the open and enabling the patient to tackle it.

The first step is to explain to the patient the objects of the analysis, and to ask him to assist his adviser in every way. He is encouraged to talk freely, and the analyst while he is talking looks out for indications, such as hesitancy when speaking about certain things, which help him to discover the direction in which the repressions lie. This is frequently a long process involving much patience and much skill on the part of the analyst, but has been applied with great success in a large number of cases.

Under the heading of neurological disorders the modern Psychologist assembles many characteristics which are not popularly regarded as pathological, such as, for instance, indecision of character, timidity, lack of self-confidence, untrustworthiness, untruthfulness, extravagance, incontinence, over-confidence, bullying, cruelty and sex-perversion.

COMPLEXES

Most of us are familiar in these days with the term "*complex*," whether we understand it or not. Usually we do *not*. The most familiar use of the word is in the expression "*inferiority complex*" which is almost invariably misused.

A person of an unusually boastful or objectionably self-assertive disposition is usually held by psychological

experts to be suffering from an "*inferiority complex*." He is *subconsciously* suffering from a sense of *inferiority*. His boastfulness, bullying and overweening self-confidence is really an attempt to overcome this subconscious sense of inferiority.

Similarly a person suffering from a pathological condition generally recognised as abnormal, such as melancholia or delusions, is probably suffering from a subconscious sense of frustration in some direction of which he is not aware. Somehow or other he is being continually thwarted without knowing it.

In universities in England, Europe and America, day in and day out, students are carrying out research work. The effects of the progress of this science are felt in many walks of life. The treatment of insanity has been revolutionised. In England, the term Lunatic Asylum has disappeared from the vocabulary except as an archaism. Many diseases hitherto regarded as incurable and held to be due to organic deterioration of the brain or nerve cells have been found to be of nervous origin, and amenable to treatment.

The Psychology of crime has been exhaustively explored and extensive reforms in the treatment of criminals have begun. Psychological clinics are being set up in crowded areas for the treatment of nervous disorders and, in the realm of industry, Psychology has been called in by big employers to help in the treatment of strain and fatigue, and to secure a closer adaptation of working conditions to the psychological requirements of the worker. It is recognised now that Psychology can help to make workers more efficient and happier, and thus increase the output and profits of industry.

Again, Psychology has found its way into education, where it is playing an ever-increasing part. It is now an important factor in the training of every teacher, and with the growth of State control over the schools it is being applied systematically to the adaptation of educa-

tion to the mental and emotional requirements of different types of children. The name of this great science is derived from the Greek word "Psyche" meaning the soul. Psyche is often portrayed with wings. There is hope that Psychology may in the fullness of time endow the soul of man with wings.

These reflections have been induced in us by the facts of sleeping and waking. Such is the background of those familiar features of our everyday life.

OBJECTS IN THE HOME

What about the activities which follow our waking up and jumping out of bed; and what about the objects with which we are surrounded? There are the oak or mahogany or metal bedstead, linen sheets and woollen blankets. There are the clothes we are putting on. There are the windows through which the sunlight streams in, the sound of an aeroplane droning far up in the sky. A motor-car rushes by; an electric train can be seen worming its way along the valley; and somewhere in the distance is heard the puffing of a steam engine. Someone next door has switched on Radio-Normandy, and the long wail of a factory hooter is heard. I pick up my safety razor with its steel blade; I lather my face with soap after dipping my brush in hot water from the tap, having first switched on the gas water-heater.

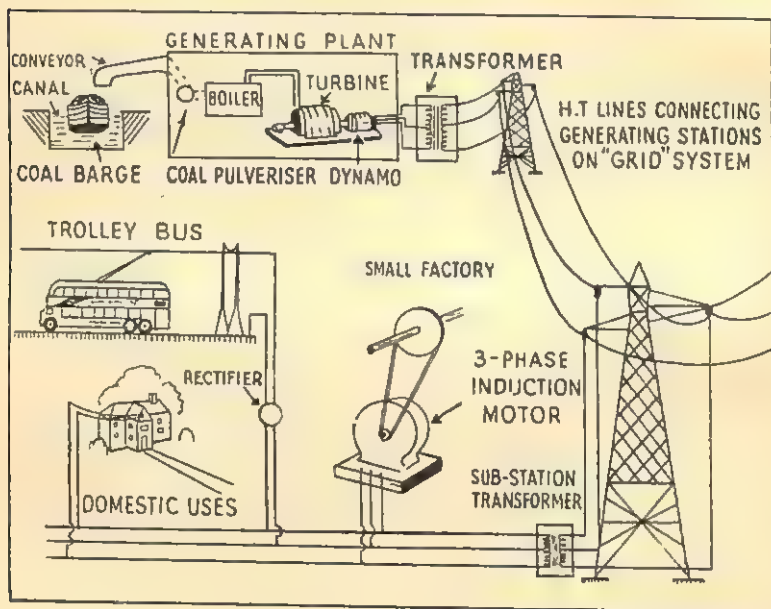
FURNITURE

Forests have to grow wood for the making of that oak bedstead and the other furniture in the room. Thousands of men are employed in the felling of trees. The science of afforestation has to see that timber supplies are kept up by judicious replanting. Thousands more are employed in the factories where the wood is converted into beds and furniture.

Flax and cotton are grown in remote parts of the world,

and spun and woven in factories into the fabrics of which our clothes and bedding are made.

Clever men have applied their mathematical talent to planning the delicate mechanism of the aeroplane and motor-car, and brilliant engineers to their fashioning. From the oil wells in distant parts, the pumps are continually extracting the oil whence the fuel is made for the motors, and hundreds of thousands of persons are working the aeroplane and motor-car factories all over the globe.



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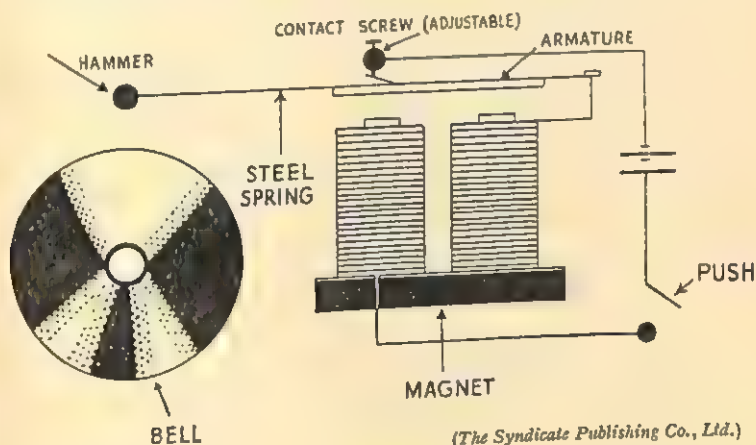
Power House, Transmission Line and Consumer's Installation.

ELECTRICITY

Great dynamos are working day and night in gigantic power-stations to produce the electricity which rushes along the rails and moves those trains.

And what of the electric lamps which are so easily switched on, and that telephone, which we take for granted as essential features of our everyday life? For some years now the pylons have been spreading over the land, and a network of electrical connexions has been established, popularly known as "the Grid." Behind this again lies the invisible machinery of Finance and of the State. The *Central Electricity Board* has now been nationalised and, from being the largest shareholder in a *Public Utility Company*, the Government has assumed direct possession and control.

The telephone rings. Behind that tinkle the whole



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Electric Bell.

gigantic machinery of the Department of the Controller of Telephones is functioning. The hundreds of telephone exchanges, the engineers, the elaborate organisation of the General Post Office are all necessary to set that bell going.

So it is with the postman's knock as he delivers a letter from the Income-tax collector. Behind the postman, the greatest State enterprise in the world is functioning

—the British G.P.O. Behind the letter with O.H.M.S. on the cover is the power of that vast administrative machine : the Inland Revenue Department.

STEEL

I wash and shave. Blast furnaces are producing the steel for my razor and factories the soap for my face and hands. Hundreds of thousands of men are at work in mines producing the coal from which comes the power to drive the steam engines, gas engines and dynamos. That energy which the burning of the coal releases was locked up millions of years ago in the vast tree trunks of primeval forests now buried deep in the earth, and converted into coal by the operation of geological forces. That energy was derived from that very sun which is shining in at the window.

The forests, the cotton fields, the coal mines and oil wells would be of no use without the ships and trains to convey their products to the factories, and from the factories to the places where they are to be utilised.

WIRELESS

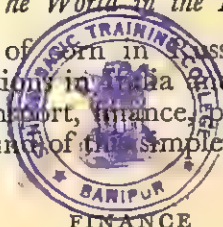
Next door, Radio-Normandy still carries on with its dance music, and we are reminded of the vast system of wireless communication now stretching over the whole globe. The great wireless stations with their high poles and their wires, which twinkle like fireflies at night, remind us of the research stations where:

*“ Man’s thought, self-gathered for an outbreak as it ought,
Chafes in the censer.”*

FOODSTUFFS

Having finished dressing, I come down to my breakfast of grape fruit, cornflakes, toast, marmalade and tea—sometimes bacon and eggs. Semi-tropical orchards,

millions of acres of corn in Russia, U.S.A., Canada, Egypt, tea plantations in India and Ceylon, and all the mechanism of transport, finance, politics and commerce form the background of the simple domestic event.



None of these things could be carried on at all without the invisible web of Finance which connects and co-ordinates the different parts of the vast industrial systems of the world. The Banks, the Stock Exchanges, the Public Companies, the currencies themselves, whether of gold, silver or paper, all play essential parts in the working of the vast economic mechanism. When by all these agencies the goods have been produced and conveyed to their destination, they need the great wholesale houses to distribute them to shops and stores where John Citizen buys.

GOVERNMENT

Interwoven with all this are the political and social systems in which these various industries exist. The vast system of contract and purchase could not be effective without the sanction of the laws, and these depend on the functioning of the Government. Upon the effectiveness of that Government will depend the stability and confidence without which no economic system can operate satisfactorily.

LAW

The flow of commodities from producer to consumer is made possible by the vast commercial and financial transactions which could not take place without a body of commercial law to reinforce them. The law of contract and purchase operates throughout the whole system. None of it can work properly without confidence.

28.4.05

28



DEFENCE

In the background we see the long low hulls of the grim grey warships which patrol the seven seas. The shipyards and the gun factories and the workshops with their hundreds of thousands of operatives are engaged day in and day out, in making and maintaining the Fleet. So it is with the great Air Arm whose co-operation is now essential to the discharge of the historic duties of the King's Navy.

CHAPTER III

BREAKFAST

*Food — Calories — Proteins — Carbo-hydrates — Alcohol —
Mineral Elements in Food—Milk—Wheat.*

FOOD

AND now for Breakfast. Has it ever occurred to you to ask yourself why you eat your food? To understand the meaning of food, the first thing to appreciate is that it is chiefly a fuel. It is used for producing the chemicals which control the body's working. It is estimated that the human body needs at least 41 raw materials and probably more. The vital energy which keeps us alive arises from the burning of our food. Every time we move, and take muscular exercise, we expend energy which can be supplied by the burning of any form of food. Furthermore, the foods have heat value in the same way as coal or oil. It is from this last fact that the expression "calories" is taken. These are the units of measurement of food value.

It is a common fallacy that fatness is due to insufficient exercise. The real cause is more often too much food. In other words, more food is taken into the body than can be consumed, and the best way to deal with the problem is not to take so much food. The requirements of different people vary, frequently according to their occupations, and here the use of calories as units of measurement becomes apparent.

CALORIES

Much work has been done in collecting statistics with a view to deciding the number of calories appropriate to

different occupations. Thus, for instance, the Canadian lumberman requires about 5,000 calories per day, whereas, for the person who is in the habit of lying in bed, whether voluntarily or otherwise, 1,700 is the average figure. A sedentary worker requires about 2,400. Why does a person lying in bed require any calories at all? The reason is that a considerable portion of our food energy is employed in keeping us warm.

PROTEINS

Most people are nowadays aware that the body needs three types of food material: proteins, fats and carbo-hydrates. Proteins are certainly the most important of these, for they are the material of which all living tissues are made. Their chief food value lies in tissue-building and repair. We need the other two for the energy required in the performance of our daily work, viz. the fats and carbo-hydrates. These two also contain elements which manufacture fat in the body, and whereas superfluous fat is undesirable, a definite amount of fat is necessary as a food reserve. There has been a tendency to underestimate its value to the body. This is why slimming can be a dangerous process. Fat is also a tissue builder because the cells of the body need, for a reason that is not yet known, a certain amount of fat.

Fat is really a rather versatile substance because it can sometimes take the place of the carbo-hydrates where there is a deficiency of these in the food.

CARBO-HYDRATES

Now what do we mean by the carbo-hydrates? We are familiar with them as sugars and starches, and they are given their scientific title because they are really combinations of carbon and water. It should be noted that neither the fats nor the carbo-hydrates contain any nitrogen, which is the special property of proteins. The

carbo-hydrates have to be transformed into a sugar substance, called glucose, before they can be burnt as fuel. This is why people suffering from serious digestive trouble take glucose instead of ordinary sugar. The reason is that it does not require any digestion at all, and is absorbed unchanged into the blood-stream. It is already the substance which the carbo-hydrates become when they have been digested, and are ready to be used as fuel in the body. Another substance which is absorbed unchanged into the blood-stream is alcohol.

ALCOHOL

Alcohol is, of course, not an essential food material, but it is none the less a food. It has been proved by experiment that, by carefully controlled drinking, a man can obtain as much as half his food fuel requirements from alcohol. However, in order to do this he would have to keep at it all day, taking a drink once every half-hour, and at the end of the day all he will have acquired will be body heat and a state of intoxication. Why is it that a man who has suffered exposure on a mountain and has been rescued will benefit by a dose of alcohol? The reason is that it increases the surface flow of blood and makes him feel warmer.

We have digressed into a reference to alcohol in order to illustrate by contrast the functions performed by the real food categories, and we will conclude by describing the protein-fat-carbo-hydrate content of some ordinary food. Meat contains, apart from water, 3 parts of protein to 1 of fat, and hardly any carbo-hydrate. In cheese protein and fat are almost equally distributed, but carbo-hydrates are absent. In milk all three are equally distributed. In butter, fat predominates.

Of the foods where the carbo-hydrate element is in the ascendant, potatoes contain 10 parts of carbo-hydrates to 1 of protein, whilst in bread the proportion is 15 to 1. Sugar is wholly carbo-hydrate

MINERAL ELEMENTS IN FOOD

We have so far considered only organic food materials, but we must not forget that the body needs mineral elements in its food as well. Calcium and phosphorus are important factors here, being essential for bones and teeth, as well as for other purposes. Calcium, for instance, in the form of chalk, controls the regularity of the beats of the heart, and has a soothing influence on the nerves. It also helps to maintain the clotting power of the blood. Phosphorus exercises an important function in the working of the muscles, and helps the body cells to absorb the food. Milk products are the richest sources of these two elements.

A young child needs more calcium than anything else. It is easy to see why this is the case, the calcium being needed for bone and teeth formation. The need for calcium diminishes, of course, as the child grows up and the bone- and teeth-forming processes are completed. The phosphorus requirements remain constant throughout life.

Whilst calcium and phosphorus are needed for the bones, salt and iron are needed for the blood. Salt is made up of sodium and chlorine, each of which, in addition to the part it plays as a component of salt, has independent functions. Sodium co-operates with calcium in controlling the rhythm of the heart. Chlorine in the form of hydrochloric acid is necessary for the gastric juices. It is, however, in combination as common salt that they do their most important work. They take an important share, in the form of saline in the blood and tissue fluid, in maintaining the chemical equilibrium of the body.

What about iron? This is an essential part of hæmoglobin, whose function it is to supply all the red cells of the body with the power to distribute oxygen. It is also required by the cell nuclei. Anæmia is a common

trouble and is due to a lack of iron in the blood. It is a curious fact that more than half the body's need for iron is supplied by the foodstuffs which contain it only in small quantities, namely, bread and meat. Egg yolk and liver, on the other hand, are rich in this substance, as are spinach, lentils and beans. A curious fact is that the human body needs a minute quantity of copper to enable it to absorb iron. The reason for this is not known, although certain theories have been put forward connecting this peculiar phenomenon with the fact of the evolution of man from aquatic organisms which use a substance called hæmocyanin, of which copper is a constituent, as an oxygen carrier.

MILK

Many of us have tea for breakfast, and take milk with our tea. A famous Scots comedian, speaking before an audience, spoke of going round a corner "to have a drink." He went on to add "a drink o' milk." Someone in the audience laughed. The comedian replied, "Aye, a drink o' milk I was sayin', and it was the first drink you had, my mon."

Milk is undoubtedly one of the most wonderful of all drinks. It contains all the three kinds of food, proteins, fats and sugar, in addition to water and salts. In cow's milk there is 3 % to 4 % of Protein, 4 % of Fats, 4.4 % of Sugar, 0.6 % of Salts and the rest water.

Why is milk so important a food for the young? It is handy, easily available, readily digestible and particularly suited for preparing new-born babies for the digestion of solid foods at a later date. Further it has been shown that milk proteins are the best obtainable for infants. One reason for this is that they are able to keep more than 60 % of the proteins in milk for the promotion of growth. Compare wheat protein, where only 25 % can be used for this purpose.

Then there is milk sugar, which is specially good for supplying energy for muscular activity, and heat for maintaining the temperature of the body. The fat supplies more energy for muscular activity and heat, and has the additional advantage of being storable. Salts are essential for bone-making, and for keeping a proper balance in the fluids of the body. Last, but not least, milk is rich in important vitamins.

The importance of Milk as an article of diet is now recognised by the State. The aspects of the Milk Industry, which have so far occupied the attention of the Government, concern adulteration, marketing and cleanliness. Adulteration is actually illegal, as is the sale of substitutes under the name of milk and butter. Regulations have been introduced imposing penalties, and milk supplies are subject to periodical inspection.

A good deal of trouble has been experienced in the past through the failure, both of milk producers and milk distributors, to take the necessary steps to secure that the milk, when delivered, shall be both clean and free from infection. The public is well aware that tuberculosis can be spread through the milk of infected cows. Here again, the evil became so serious that the Government found it necessary to issue regulations, and arrange for inspection.

The Milk Marketing Board was set up in order to encourage the production of milk, and raise the standard of quality. To this end it fixes prices and arranges for the disposal of the produce. Before the introduction of this scheme, the vital industry of milk products was not in a satisfactory state.

WHEAT

You probably have toast with your breakfast, but it may not occur to you how vast are the energies which have made it possible for this toast to be in the rack in front of you.

One-third of the human race depends upon wheat as its staple food. There are other types of cereals, such as maize, rice and millet, but none of them has the food value of wheat. It was the staple food of the ancient Egyptians, 7,000 years or more ago, and of the Babylonians, 6,000 years ago. It was grown by man in the Stone Age, and by the ancient inhabitants of China. As time went on wheat crops ousted other cereals. Imperial Rome made Britain one of her principal granaries. The British introduced its cultivation into America. Fortunes have been made and lost on wheat. It was recently estimated that there were at least 585 million wheat eaters in the world, that is to say, about one-third of the total population.

Chemists have analysed wheat, and it has been discovered that one grain contains 71.2 % of carbo-hydrates, 11 % of protein, 12 % of water, a little fat, cellulose and minerals. The carbo-hydrates provide us with energy, while the proteins promote growth and replacement of used-up tissues. The nourishment value of wheat is therefore obvious. Again, we now give vitamins pride of place in judging food values, and wheat is known to be rich in one important vitamin and to contain two others. Vitamin B is essential to human growth. It controls the appetite and certain actions of the heart muscles. Lack of it makes for anæmia. Vitamin A protects us against infection, and is also the chief source of Vitamin E which influences the powers of reproduction. Vitamin A is to be found in wheat.

Wheat has great value as a giver of energy, and also as a protector against disease. An illustration of the latter fact was strikingly given when the replacement of maize by wheat in certain parts of the world resulted in the disappearance of certain wasting diseases.

We might perhaps be justified in supplementing the words "Give us this day our daily bread" with a prayer that a large portion of it might consist of wheat.

CHAPTER IV

THE EARTH AND THE SUN HAVE MADE US WHAT WE ARE

Economics—The Geographical Aspect—The Lithosphere—Soil Erosion—The Tsetse Fly as a Check to Erosion—The Effect of Civilisation—Sheet Erosion—The Hydrosphere—The Atmosphere—The Biosphere—The Psychosphere—The Astrosphere—Eclipse—The Spectroscope—Einstein—Eclipses help Historians.

ECONOMICS

ECONOMICS is the branch of knowledge which endeavours to answer the question: How do we get a living? It is necessary for everyone to know something about this subject in view of the fact that everyone over the age of twenty-one has a vote, and is, therefore, expected to take an intelligent interest in the affairs of the country.

Where do we get our living from? And how do we get it? The answer to these questions is just as important to us as the question of how we make our own small individual living. In other words, we could not scratch a living at all if the race as a whole did not know how and where to get its living.

THE GEOGRAPHICAL ASPECT

Now the human race gets its living from the earth, the air, the sea and the rivers. In other words, it has to extract its living from its environment. Modern geography divides the environment of man into six spheres, viz. the lithosphere, the hydrosphere, the atmosphere, the biosphere, the psychosphere and the astrosphere.

The lithosphere includes the earth's crust, the rocks and soil of which it consists, and the forests and pastures, corn and fruit which grow upon it. The hydrosphere includes the water on and in the earth; the rivers, the waterfalls, seas and oceans. The atmosphere refers to the air, which through climate, wind and rain, profoundly affects man whilst endeavouring to make a living for himself. The biosphere includes all the living things which exist on the earth's surface, and below. The psychosphere includes within its scope the races of mankind, and their aptitudes; while the astrosphere refers to the sun and the stars.

Three of these, namely the biosphere, the psychosphere and the astrosphere, do not appear at first sight to have much to do with economics, but we shall see when we come to deal with them in detail, that they have, in fact, a very great influence.

THE LITHOSPHERE

It is from this sphere that we extract our minerals and our metals; here it is that our forests grow, from which we get our timber; on its fertility depends the quality of our wheat, and of our fruit and vegetables; from it we get coal and iron, copper and lead, silver and gold.

If man does not closely study its behaviour, the earth does some strange things, very disconcerting to man. Earthquakes, for instance, have played a prominent part in the history of mankind, with far-reaching social and economic consequences. Their major activity is confined to certain areas of the earth's surface. These areas are indicated upon maps by what are known as *Seismic Lines*.

SOIL EROSION

The chief cause of deserts is Soil Erosion, viz. the uncontrolled action of wind and water which brings about changes in the physical composition of the top soil, and

ultimately causes its complete removal. Once this has happened, nothing man can do can reclaim the land. That very busy and practical continent, North America, suffers severely from the effects of soil erosion, and is busy discussing with its scientists, and indeed, scientists all over the world, whether anything can be done about it. It is all very well for us to talk, who are, fortunately, entirely free in our little island from this great evil. We are not, however, free from the necessity of thinking about it, because soil erosion is at work in many parts of the Empire. We cannot dismiss it as a piece of bad luck for America which does not concern us. It is pressing with increasing severity upon many of our African colonies.

Erosion damage has been so severe in Basutoland, that the Colonial Development Fund has made a grant of £162,000 for the construction of anti-erosion works.

The greater part of Africa is subject to erosion, and, through this process, vast areas of once-productive soil have been turned into desert. It is known, for instance, that in ancient times the land around Carthage was one of the most fertile regions of the Roman Empire. Now it is mainly desert. Tropical forests once flourished where now are the deserts of Southern Sudan. Pliny, the Roman historian, records that Roman explorers believed that these forests reached as far north as Khartoum.

It has been estimated, by a French authority, that the Sahara Desert has for the last 300 years been advancing into French West African colonies and Northern Nigeria at the rate of 1 kilometre per annum.

Man is responsible himself for the creation of some of the deserts. It is a tragic fact that, whereas an inch of fertile soil may require several millions of years to form, it can be destroyed by man in a few years. In this small covering of soil are stored all the foods which nourish crops and pastures. If, therefore, the erosive action of wind and water is allowed to play upon it unchecked, this top soil will be converted into dust. Now one of the

greatest protections against the erosive action of wind and water is a covering of forest, bush or grass. This prevents the wind or rain from scouring the land and removing top soil in the form of dust or silt. It holds back rain-water, and enables it to soak into the soil, and drain down through it to form underground reservoirs which are the sources of springs and wells.

When the vegetation is stripped from the land, some of the rain-water, instead of soaking through, runs off the surface into streams and rivers, and is lost. In hot countries much of this water just evaporates. And so, in the course of time, the underground water reservoirs diminish, the streams which are fed by the springs begin to fail, and the rivers they feed disappear. In due course, the underground reservoirs shrink or disappear, excepting when fed by heavy storms, when they are converted into torrents and carry away large quantities of valuable soil. There is a river in the U.S.A., for instance, which in normal times carries down one ton of silt per day. This river was found to wash down nearly nine thousand tons in a single hour after heavy rains in the regions of the river-head.

The surface of the continent of Africa is abundantly marked with the dried beds of what once were rivers flowing all the year round. At the present time there is a continual increase in rivers which only flow at certain seasons of the year, and a continual decrease in the rivers which flow all the year round.

THE TSETSE FLY AS A CHECK TO EROSION

We shall refer elsewhere to the ravages of the tsetse fly, which preys upon men and cattle, causing the spread of the terrible disease of Sleepy-sickness. By a strange *volte-face* on the part of nature, it is quite possible that this fly may be saving considerable areas of Africa from destruction by soil-erosion by keeping cattle away from them. Cattle, if allowed to browse unchecked in large

quantities, destroy the vegetative cover of the soil, and produce the results above defined. Thus it may be found that the campaign against the tsetse fly is taking away with one hand what it gives with the other.

During the last hundred years, the process of stripping Africa of its vegetation has been going on steadily, and it is continuing more rapidly at the present time. This is being done by deforestation, extension of cultivation, and over-grazing, all of which have been accelerated by the advance of European civilisation across Africa.

THE EFFECT OF CIVILISATION

Another effect of civilisation has been the abolition of tribal warfare. From the Cape to Cairo, from Kenya to Sierra Leone, the Pax Britannica and the Pax Gallica have practically abolished war. Again we meet a paradox. The sword has been turned into the plough-share; or perhaps, to speak more accurately, the spear into the digging knife. Thus the natives in Africa, instead of fighting with each other, have been clearing large areas of forest and bush to make way for cultivation. The equatorial forest is only a shadow of its former self. It has been estimated that only 10% of Africa is under trees, whereas the percentage necessary to preserve the fertile soil and the water supplies is 30.

The population of Africa is growing, and more cultivated land is needed, so every effort is being made by Colonial Governments to increase the production of native-grown crops. Africa is also producing such crops as cotton and coffee for export. This export business has been found very profitable, and the areas under cultivation of these crops have been increased. Here we have another danger to the top soil. This arises from the fact that much of the new land which is being cleared for cultivation lies on steep hill-sides. It is a well-known fact that the steeper the slope the greater is the liability

to erosion. On steep hill-sides the only way to guard against this is terracing, and it has become an urgent need that this should be done on a large scale in Africa. It is interesting to note that this same problem of soil-erosion arises in an acute form in Russia, where the Soviet Government is endeavouring to bring to bear all the resources of science on the problem.

SHEET EROSION

Cultivation of land on slopes leads to one of the worst types of erosion, known as sheet erosion. This is a process of washing away the finer clay particles in the soil, thus converting a rich soil into one that is poor and coarse. The Japanese have adopted terracing, but the Africans have not as yet done so.

Sheet erosion is insidious, because it takes place below the surface and cannot be seen. It has been estimated that by this process in America an appreciable part of the top soil of the affected areas has been washed away. This has been reflected in decreasing production of corn in the Middle West and cotton in the South.

THE HYDROSPHERE

The rivers and oceans of the earth provide us with the means of transporting goods from one place to another. The rivers provide the power for driving mills, and hydraulic machinery generally; they irrigate the land and help to make it fertile, and provide the reservoirs from which we draw our water supplies. The waterfalls and tides give us electrical power, and the oceans give us food in the form of fish.

THE ATMOSPHERE

From this we get the oxygen which enables us to breathe and to live, and also enables us to kindle fires, for nothing can burn without oxygen; from this source

also we derive gases. In the past it has been a source of power for driving windmills and sailing ships, and to-day it is the medium through which the aeroplane makes its way. Man makes use of climate for the production of wealth, as, for instance, moisture in cotton manufacture. Climate again is of tremendous importance to man in the influence which it has upon the production of various foods. Cereals and certain fruits and certain timbers require a moist and moderately warm climate, whilst rice, bananas, pineapples, spices and certain kinds of timber require tropical climates.

THE BIOSPHERE

Here we have the animals and the vegetables which live and grow on the surface of the earth. Animals, such as cattle and poultry, provide man with food, and also with hides, leather, furs and feathers. The vegetation which grows on the surface of the earth provides cereals, fruit and timber.

THE PSYCHOSPHERE

The mental and moral characteristics, habits, customs and aptitudes—the natural endowments, in fact, of the different races of mankind—have a far-reaching effect upon their economy, i.e. the way they make their living. Thus we find the energy of the western races of the northern hemisphere placing the races of this part of the world in a position of supremacy over the rest. Differentiating between some of the various European nations, we find practical organising ability in the Anglo-Saxons, mathematical and artistic genius, coupled with an exceptional capacity for thrift and industry in the French, and organising capacity and industry in the Germans. Again, we find that the adventurous spirit and courage of the English and the French have carried them all over the world. The Germans are noted for their capacity

for painstaking research applied to the scientific development of industry and destructive military weapons.

THE ASTROSPHERE

The biggest factor here is the sun, whose rays are the source of all life and all energy in our planet. In these days of violet-ray treatment and sun-bathing, it is hardly necessary to emphasise this aspect. Even the moon plays her part through the tides, which have a vast influence upon man's productive activities, not only by the help they give to shipping, but in modern times as providing sources of power. The tides are due to the attraction exercised by the sun and the moon upon the oceans of the earth. The stars play their part, not only in guiding mariners, and in providing the basis on which the instruments which guide them are constructed, but in helping the scientists to probe deeper and deeper into the nature of matter, and deduce those laws of physics which are of such incalculable value to modern industry.

It is not only by its gift of heat and energy that the sun helps humanity. Its eclipses have been of great value to scientists in their researches into the constitution of matter, especially the nature and functions of radiation.

ECLIPSE

What is an eclipse? Consider what happens if we look down from an aeroplane. We see the shadow of the plane moving along the ground below us. If anyone happens to be standing in a spot where the shadow passes, he notices that the sun is hidden for a moment by the aeroplane. Now, if we are standing on a portion of the earth on which the shadow of the moon is cast as it passes between the earth and the sun, the same thing is happening as in the case of the aeroplane. As the moon moves, its shadow sweeps across the earth. The shadow of the moon is 80 miles wide, and moves over the surface of the

earth for thousands of miles. There is, accordingly, a belt, 80 miles wide, and thousands of miles long, from which alone the eclipse can be seen.

The eclipse, therefore, is caused by the moon covering up the sun and casting a shadow on the earth. Whether the moon entirely covers the sun, or only partly, depends upon its distance from the earth when the eclipse takes place, for its distance varies. When the sun is entirely hidden it is called a total eclipse. We should realise that the sun is an immense furnace. Hence, when an eclipse occurs flames shoot out behind the moon, which are sometimes hundreds of thousands of miles high and give a red glow. Around the outer circumference of the picture thus represented in the sky, there is a silvery glow, and this is known as the corona. In the ordinary everyday glare of the sun these phenomena cannot be seen. Hence the great scientific interest in an eclipse. It gives an opportunity to examine the mountainous flames and the corona and find out what they are made of and what they do.

THE SPECTROSCOPE

At this point the *Spectroscope* comes into play. By its means we can find out something about the chemistry of the sun and the stars, and ascertain what elements are present in them. Remember that all the elements of which matter consists, such as, gold, carbon, sulphur, hydrogen and oxygen, are made up of atoms which are in one respect similar to broadcasting stations, for both send out electric waves. The atoms of the different elements differ from each other, and one of the ways in which they are distinguished from each other is by the fact that their electrical waves differ in length; in other words, they can be distinguished by their wave-lengths, just as we distinguish London and Moscow by their wave-lengths.

There was an eclipse in 1868 at which a yellow light was seen coming from the sun, the wave-length of which did not correspond with that of any known atom. This pointed to the existence of a hitherto unknown element. It was given the name of helium, after "Helios" the Greek word for sun.

Twenty-seven years later this identical wave-length was discerned upon the earth itself. The new element helium existed in the crust of the earth as well as in the sun. Since then it has been brought into use as a non-inflammable substitute for hydrogen.

There are other reasons why scientists so closely observe eclipses. It will be realised that, in the regions of space surrounding the sun, matter exists in a medium a million times more rarefied than the atmosphere of the earth. It follows that if the behaviour of matter in these regions can be observed, we shall learn a lot more about it than we can by direct observation of its behaviour in the earth's atmosphere, and under conditions of extreme heat, extreme cold, etc., such as we cannot produce in our laboratories. In a sense, our scientists are now treating inter-stellar space as a laboratory, where hotter furnaces and higher vacua than can be produced on earth are to be found.

EINSTEIN

Einstein predicted that the track of a ray of light passing near the sun would bend under the weight of the light in the same way that the course of a bullet is bent towards the earth. The eclipse of May, 1919, was used to test this theory. The way it was proposed to test it was as follows: If the theory was correct, the rays coming from certain stars would bend as they passed close to the sun. The only way to test this was to photograph these stars in daylight, but this could be done only when the sun was darkened by an eclipse. Photographs were taken, and Einstein's theory was confirmed.

ECLIPSES HELP HISTORIANS

In China records of eclipses go back beyond 2000 B.C. Babylonian tablets contain records dated 1063 and 763 B.C. These and similar records have helped historians in compiling the history of these early times. To illustrate this, let us imagine that some thousands of years in the future historians are trying to compile the history of our own times, of which only scanty records are available owing to civilisation having been destroyed by aerial warfare. We will suppose that they discover a document saying that a total eclipse of the sun was observed in the eighteenth year of the reign of King George V. At this point, historians would consult the astronomers, who would tell them the dates of eclipses visible in Britain during three centuries, which have been established by the historians as the only ones during which the accession of George V could have taken place. They are told that the dates of these eclipses were 1725, 1928 and 2000. They deduce from this that there can be only three possible dates on which the accession of George V could have taken place, viz. 1707, 1910 and 1982; and no doubt they will have other historical evidence in their possession that will enable them to fix on what date the accession actually took place.

Here, once more, we have an instance of the way in which facts, which appear to be totally unconnected, are found on examination to have a very intimate connexion indeed. Thus, at first sight, it might well be asked what possible connexion there can be between an astronomer observing an eclipse and an historian writing the history of an Emperor of China who lived 4,000 years ago. It will now be conceded that the connexion is really very close.

CHAPTER V

THE HUMAN RACE AT WORK

Human Wants—Production—Labour—Manual Labour—Intellectual Labour—Directive Labour—Division of Labour—The Craftsman—Mechanical Labour—The Textile Trade—Power—Industrial Revolution—Social Consequences—Whitleyism—Trade Unions.

HUMAN WANTS

IN the previous chapter we have been considering the sources from which the human race derives its living. Let us now consider how man goes to work to make this living. Before doing so, however, it is as well to remember that all this complicated structure of industry and transport and markets and finance arises not only from the primitive necessities caused by hunger and thirst and reproduction, but that a whole complicated series of secondary wants and desires has grown up with the development of civilisation throughout the ages. There are innumerable wants and desires in these days which are products of civilisation and do not arise from the necessity of satisfying hunger and thirst.

PRODUCTION

The first stages in the task of extracting from nature the wherewithal to satisfy the needs of mankind is performed by the farmer, the miner and the fisherman. The machine-tool maker and the factory hand get to work on the products, and the manufactured article is handled by the transport worker and passed on to its destination. At various stages in its progress from the sphere of nature whence it is derived, to the human being who is to con-

sume it, the article will according to its character be handled by artisans, builders, decorators, carpenters, plumbers, engineers, etc.

All these people require machinery, workshops, factories, roads, railways, rolling stock, motors, ships, offices and dwelling houses, to provide which capital is required. When the product is complete it passes to the wholesale dealer, from whom it is purchased by the retail dealer, who sells it to a vast number of people engaged in a great variety of occupations. Many of these are the very people who have been engaged in the work of producing, manufacturing and distributing the product. It will, therefore, be observed that the ploughman and the miner and the factory hand are not only producers, but also consumers. They supply the demand which they help to create. In this way the vast majority of consumers are also producers, and vice versa.

In all this system of production, exchange and distribution of the commodities required to satisfy these people's wants, money is an indispensable factor, and so is capital. In the following chapter will be found, therefore, some remarks on the part played by money, financiers and the Stock Exchange. The whole process is subject to strange variations known as slumps and booms which are also dealt with in the ensuing chapter.

LABOUR

We have left the details concerning the parts played by the financier and the banker to a subsequent chapter, because it is necessary first to explain the functions of the worker. The transmutation of the raw material provided by nature must be done by the actual labour of men and women, which is, therefore, one of the indispensable factors in production. It is a mistake to suppose that precedence in importance can be given to any of the factors. Labour and finance are equally indispensable.

This is a fact whether they are controlled by the State or by private persons or Corporations.

LABOUR AND PRODUCTION

What part does Labour play in production ?

We are including the use of human intelligence in the meaning of the word "labour." Thus, the first thing to be appreciated is that however great may be the wealth stored up by nature in the crust of the earth, in the air and in the sea, it is of no value at all until it has first been discovered by human intelligence. Nor does it even then acquire value until human labour has been applied to it, and it has been extracted and made fit to be utilised. Take, for instance, untilled virgin soil, covered with masses of under-brush, all of which must be cleared away for the soil to be tilled and the grain to be sown. Then, again, take such things as mineral springs, whose resources must be collected and stored before their valuable properties can be utilised by the human race. Even such homely things as mushrooms must be collected, and such familiar things as fish must be caught.

Labour may be classified under three headings. Manual; intellectual; and directive.

MANUAL LABOUR

Manual labour is essentially energy applied to the displacement of objects or their component parts; thus the potter alters the shape of the clay. Before you can produce a loaf of bread you have to do a lot of displacing. You displace the earth by ploughing it; you displace the seed when you sow it; the corn when you reap it; the grain when you winnow it, grind it, sift it and knead it, before baking it. All this consists of displacement of matter.

If you examine any given industry, again you will find this to be the fundamental fact. In all the manufactures transformations take place in the constitution of matter which modify its physical and chemical properties, thereby producing the finished manufactured product.

We must not, however, forget that in all this human labour alters, but it does not create. Man does not dictate the growth of the plant from the seed. This is a process of nature for which he is in no way responsible. All he knows is that under certain conditions, which he can produce, this growth will take place, but how it takes place he does not know. Similarly, he finds that under certain conditions carbon and iron will combine to produce steel. There again, he can arrange the conditions, but it is nature that effects the amalgamation and produces the new commodity. Put in another way, what man does is to place the proper material in the right way. Thus he places the seed in the ground, the vintage in the vat, the ore in the furnace; and nature, if other proper conditions are present, does the rest.

INTELLECTUAL LABOUR

Through the operations of the intellect it is discovered that aluminium can be extracted from mud, and once the process has been invented it is for manual labour to extract it.

Again, by intellectual labour it is discovered that from the by-products of coal, perfumes and dyes, more splendid than Tyrian purple, can be extracted; but here again the work of extraction in the last resort involves manual labour.

Yet we must never forget that 140,000 varieties of plant have been found to exist in the vegetable world, and hundreds of thousands of species in the animal world,

and that, of the innumerable varieties of matter, relatively few are known. All these are gifts of nature, the infinite material that has been given to man to work upon. Every blade of grass, every grain of sand, is a mine of possibilities.

DIRECTIVE LABOUR

The importance of scientific management is an accepted axiom in modern times. This is where Directive Labour comes in. Its function is to co-ordinate, organise, plan and look ahead. In the complex modern State it is at least as important as the other two categories.

DIVISION OF LABOUR

One of the outstanding features of a modern industrial community is what is known as Division of Labour. In its simplest form, labour was not divided. The workman performed the whole of one stage of production. The tailor made the coat, the cobbler the boot and the carpenter the table. These were craftsmen, and it was only with the advent of machinery and mass production that this type of labour gave way to division of labour. Nowadays when a shoe is made in a factory, the leather is cut by one process, stitched by another, and the soles and heels are put on by separate processes.

THE CRAFTSMAN

A certain degree of division of labour has existed from quite early times, in a comparatively simple form. Consider such surnames as Carpenter, Mason, Smith, Turner, Weaver, Draper, Taylor, Dyer, Sadler, Miller and Baker. Here we have definite evidence of division of occupation in the early history of the nation. There are obvious advantages in the dividing up of functions. Skill comes from a constant repetition of the same acts. We do not, for instance, stop to think how much constant

practice and repetition have preceded such familiar acts as reading, writing, tying up shoe laces, and even putting on clothes. All these activities which every normal person performs with the utmost skill are now habits acquired after long processes of repetition. So it is with piano playing and typewriting.

The craftsman through constant practice is able to produce much more. There is a great saving of time also, through following the task without interruption. The skilled carpenter, for instance, will do carpentering jobs much more quickly and much better than the farmer who tries to do his own carpentering.

Now we come to the much more complicated division of labour which has come with the advent of machinery. The admitted vastly superior productivity of machines is due in the first instance to repetition of the same movements again and again, and with increasing rapidity.

In the old days, each craftsman performed many different tasks and used many different tools. The carpenter, the tailor, the mason and the smith were masters of their own trades as a whole. The tools they used were hand tools, and the use of each of these tools required much practice, adaptation, judgment and flexibility.

MECHANICAL LABOUR

As time went on, these occupations became subdivided. Take, for instance, the making of cloth, which was divided between the spinner, the weaver, the fuller and the dyer. The process of subdivision went on in most occupations, which, as time progressed, became more and more subdivided. The more they were subdivided the narrower became the scope of labour in each occupation, and the more important became mere repetition until the point was reached where repetition replaced judgment, dexterity and flexibility, and it became possible to begin to substitute mechanical force for human labour. This

process is proceeding rapidly to-day. The machine cannot equal the human hand in dexterity and flexibility, but owing to its capacity for constant repetition in an exceedingly short space of time, it outdoes the human hand in its capacity for production.

THE TEXTILE TRADES

The change from handicraft to machine production began during the second half of the eighteenth century. The first trades to be affected were the textile trades, which were revolutionised by Hargreaves's Spinning Jenny and Arkwright's spinning machine, which Crompton combined and improved. The combined machine was called a "mule."

All these three processes consisted of the mechanical repetition of the twisting of fibre. The next thing was to apply water power to set them in motion. Similar things happened with weaving. At the beginning of the nineteenth century, the power loom supplanted the hand loom, and by the end of the century the old weaver's handicraft had disappeared in England and the United States of America.

The textile mechanical inventions were first applied to cotton, which has an even homogeneous fibre, suitable for machinery running at uniform speed. The fibre of wool, linen and silk is not so even, and machinery was applied at a later date. In the case of silk, which has delicate and irregular fibres, manipulation and machinery on a large scale are of quite recent date.

POWER

Side by side with the development of machinery was the development of power, that is to say, the utilisation of natural energy for the purpose of driving the machinery. In 1781 the steam engine was first brought into effective use. It was first of all employed for the purpose of pump-

ing water out of mines. Then in 1830 the locomotive was brought into use for transportation purposes by Stephenson.

THE INDUSTRIAL REVOLUTION

These inventions were the starting-point of the Industrial Revolution which brought about the greatest change in social and economic conditions which has ever taken place in so short a time.

It was the industrial revolution that brought about such great advances in the division of labour. It effected this because the machine, by continuously repeating separate operations, made it possible almost indefinitely to split up the different stages of production. Hitherto the carpenter craftsman had himself done all the sawing, planing, joining and moulding. Each of these operations was now done separately by a separate machine or part of a machine in an enormous workshop, and the tendency is to divide more and more.

The cobbler used to put the shoe together himself, but in the modern factory the shoe goes through eighty different processes. Similarly in the manufacture of files there are ninety operations between the steel entering the factory and the file leaving it; and similar conditions apply throughout such industries as ironworking, textiles, printing and book-making.

Modern machines become more and more complex, but they are all based upon the fundamental principle of automatic repetition of movements. The adaptable tool and the skilful workman are relatively less and less needed.

It is the apparently unlimited store of natural energy convertible into power which gives modern division of labour such an immense advantage over the old methods of craftsmanship, when it comes to producing goods in large quantities. As previously indicated, repetition of

movements is the fundamental thing. Once this has been achieved the machine can go on repeating these movements indefinitely with an increasing degree of rapidity and efficiency as experience teaches man to improve upon these processes.

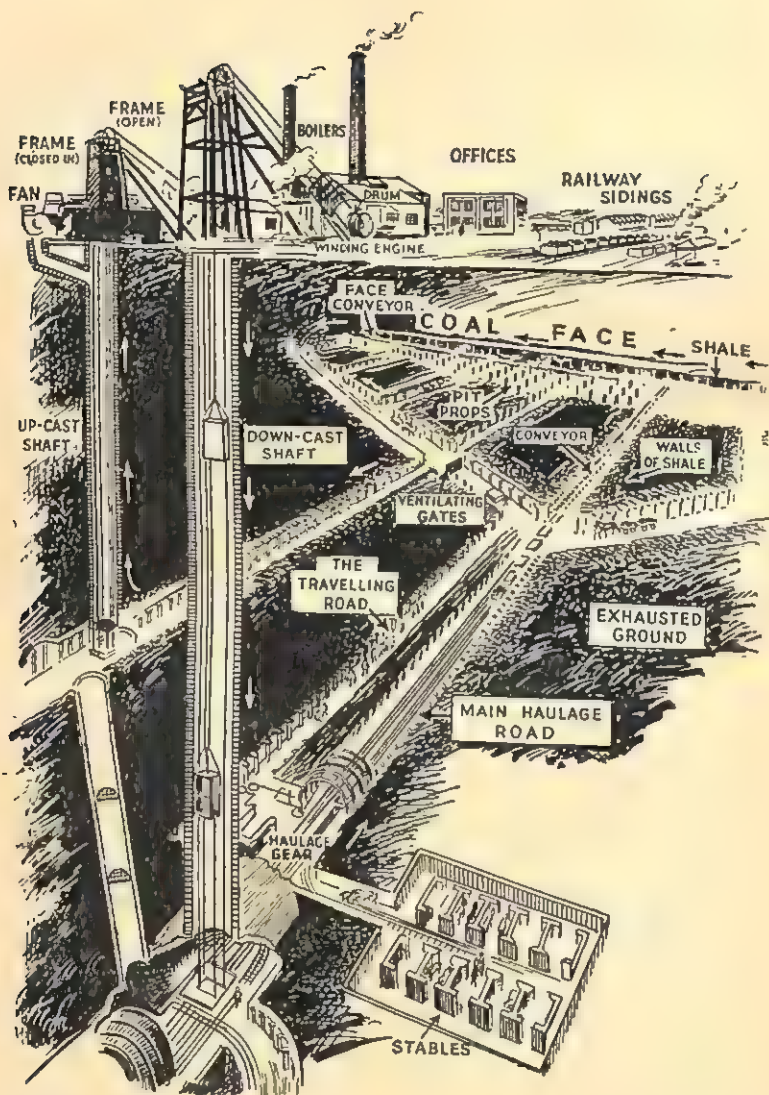
Until recently the chief sources of power have been coal and water and a great deal of labour was employed in manipulating them. Now that electricity is rapidly becoming the chief source of power, great changes have taken place and will continue to take place in the distribution of labour, much of which has been diverted into new channels.

SOCIAL CONSEQUENCES

The advent of the age of machinery has operated in different ways upon different sections of the community, and its social consequences have also varied. Unquestionably, for instance, there is a continual tendency to create unemployment through the substitution of the machine for the man. This is to some extent set off, but perhaps only partly set off, by the multiplication of fresh wants which arises from the greatly increased productivity.

Another consequence has been the development called monopoly. Why has this occurred? Because the development of machinery has made it possible to concentrate manufacturing processes in one place or under one control, and has given the power of capturing the markets to the large-scale producer, leaving little room and no hope for the small man.

It can also be said that everywhere since the advent of the machine age there has been a tendency towards centralisation, and this has shown itself on the side of the workmen as well as the employers. The personal touch between the employer and the workman in the main disappeared, and the two classes have formed associations among themselves for the protection of their interests.



This diagram shows the method of coal mining on the "Long-wall" system —the one most used in Britain. Coal is worked in a straight wall along the seam. The illustration shows only one of the "districts" in a mine of which there may be as many as half a dozen.

(Pictorial Education)

Hence the growth of trade unions and employers' federations.

On the credit side of the account of the machine age must be set great improvements in sanitation and hygiene, and in the health of the workers, but on the debit side must be set a tendency to loss of character due to the monotony of the work. Another debit is the widening of class distinctions. These distinctions of course existed in the past: there was the nobility; the professional classes; the merchants and tradesmen; the craftsmen; the squire; the parson; the farmer; the yeoman and the peasant; but all these people acknowledged the definite place in the life of the community occupied by the classes other than their own, and there was often a fairly close personal contact. In modern times the class distinctions tend to be based on wealth. They are undoubtedly much wider, and prevent personal human contacts.

In the industrial world, the influence of division of labour works both ways. We have pointed out how it tends to create differences and oppositions. However, in other ways it makes for combination and co-operation. A large number of units combine to create one product. The workers in a factory combine into trade unions and clubs and friendly societies, and the factories themselves combine in order more efficiently to satisfy the wants of the community.

WHITLEYISM

A movement has taken place in recent years towards minimising the differences between the employer and the employed. This movement is named after its founder, Whitley, and is popularly known as Whitleyism. Whitley's purpose was to do away with disputes between employers and employed, to avoid strikes, and endeavour to secure co-operation between both sides on all matters which affected them jointly. With this object in view

he proposed that what are known as "Whitley Councils" should be set up, on which representatives both of employers and of the employed should sit. The employed would bring before the employers in these Councils such matters as the need for improved ventilation in the factories, excessive hours of work and other causes of strain and discomfort to the workers. They would also discuss wages with the employers if necessary. The employers would put forward their side of the question, and an attempt would be made to arrive at a solution by the co-operation of both sides.

The critics of Whitleyism argue that it ignores realities and assumes an identity of interest which does not in fact exist. The truth probably lies half-way between the two points of view. Undoubtedly for complete success Whitleyism needs a high degree of enlightenment on both sides. It cannot be denied that where attempts have been made to carry it out, it has had great educational value in teaching each side to understand the point of view of the other. Whitley Councils are classed as local and national. The local council is set up in a particular factory or in a particular area, whereas the national council is the central council for the whole industry.

Another attempt which has been made to secure the settlement of disputes between employers and employed without recourse to strikes is Industrial Arbitration. A court known as the Industrial Court has been set up by the Government, to which the employers and the employed can refer their disputes, but they must be prepared to abide by the decision of the Court once they have agreed to submit the dispute thereto.

The great instrument which the workers of the machine age have used with a view to improving and maintaining their standard of living, and generally protect themselves, has been trade unionism.

TRADE UNIONS

Trade Unions have exercised a great influence on the national life during the last fifty years. They were formed in the first instance to enable the workers to combine together to resist what they considered undue pressure upon, or injustice to, any of their individual members, and to obtain an improvement in the standard of wages and the conditions of labour. Added to this was the insurance of their members against unemployment and sickness.

Some of the more important objects aimed at by trade unions are the lessening of the hours of labour, the enforcement of a minimum wage, the limitation of overtime and the preventing of "blacklegging." The latter term may be taken to apply to an attempt to carry out during a strike the normal duties of the men who are on strike. A variant upon this is the prevention of members of a union from performing any other class of work than that which the union and the employers have fixed for them. Exacting rules exist under this heading, and employers have to be careful, if they are to avoid trouble with the unions, to see that the same men always stick to the same job.

Some important results arose out of the General Strike of 1926, which was organised by the central governing committee of the trade unions. As a consequence of this strike the Government passed through Parliament the Trade Disputes and Trade Union Act of 1927.

Under this Act a general strike is declared to be illegal, and, furthermore, the intimidation of "blacklegs" is also declared to be illegal; and no person can be compelled by any trade union to subscribe to the funds of any political party.

There is nowadays a much greater degree of co-operation between employers and unions than in the past. There was constant war between them in the days when

unions were fighting for increased wages and reduced hours, and improved conditions of labour. The employers find it increasingly to their interest to consult trade union officials in regard to proposed changes affecting the workmen. It can be said of the trade unions nowadays that they consistently use their influence against the abuse of the strike weapon by the workers.

An important development occurred during the World War of 1939-45. This was the introduction of the Essential Works Order which empowered the Government to prevent any worker, employed in an establishment deemed to be engaged on essential work, from leaving his or her employment. It also prevented the employer from discharging any such employee. This measure was adopted with general consent, at a time of grave national danger. It is a complete departure from that Freedom of Contract which, since the break-up of the Feudal System, has been one of the chief bulwarks of the liberty of the individual. Without such a law it would have been impossible to give effect to the national planning of production without which the war could not have been won.

CHAPTER VI

THE FINANCIER, THE STOCK EXCHANGE AND MONEY

*The Meaning of Trade—The Financier—The Government
and the Financiers—The Stockbroker—The Stock Exchange
—The Gold Standard—The Financial Crisis of 1931—
Foreign Exchanges—Banks—Slumps and Booms—Free
Trade and Protection.*

THE MEANING OF TRADE

THE student will find it easier to master the intricacies of Trade and Finance if he constantly bears in mind that the object of trade is the exchange of goods and services. The complex superstructure of banking, finance and commerce exists in order to further this fundamentally simple purpose.

THE FINANCIER

The *Financier's* services may be described as fourfold:

- (1) Service to the Investor.
- (2) Service to Industry, Commerce and Trade.
- (3) Service to the Community.
- (4) Service to themselves.

The term "financier" covers a wider field than mere Brokerage. It is the business of the financier, whether working as a single individual or as a corporation, to find fruitful avenues for the use of money. In the discharge of this function he will sometimes form companies (hence the term *Company Promoter*), and sometimes promote new issues on behalf of existing undertakings. In this way, by seeking fresh avenues for the investment of

money, the financier helps to promote new industrial ventures and to stimulate the development of existing undertakings. He will examine the possibilities of a new invention, and, if he takes it up as a financial proposition, will endeavour to induce the public to subscribe the necessary funds for its development. Thus activity of the financier lies behind the printed prospectuses which appear on the financial pages of our principal newspapers, and sometimes are sent to us by post.

In this way the financier and the Financial Corporation have played an essential part in the great modern development of industry. Before a new oilfield can be exploited, a new mine set going, an electric railway inaugurated, a fleet of passenger aeroplanes brought into being, a new toilet preparation brought into the market, the capital for plant and machinery, labour and transport, must be forthcoming. Often these new enterprises are actually brought into being by the financier who is *prospecting*, i.e. seeking new fields for the employment of capital.

There are good and bad financiers. The bad ones are the fraudulent company promoters and bucket-shop men who induce the public to put money into enterprises that have little more than a paper existence.

A bucket-shop promoter is a broker who is not a member of the Stock Exchange, is not subject to its rules and penalties, and deals in stocks and shares of a speculative and often doubtful nature. The origin of the word "bucket" in this connexion is said to be derived from a lift known as a bucket in which speculators were taken up to a gambling exchange in Chicago.

The good financiers seek to find sound investments and only put them before the public when they are satisfied as to their productive possibilities.

Most of us realise that an intangible thing called *Public Confidence* has a great influence on the flow of trade and upon employment and prices.

The financier to do his job properly must be an expert both in gauging and in influencing the state of the public mind. If people are nervous they will be loath to re-invest their money, and trade, industry and commerce will suffer.

During the war many of the functions of the financier were taken over by the Government. During the period of reconstruction following the war the flow of capital will largely be directed by the Government. This does not necessarily mean the disappearance of the financier and Corporations. The Government will no doubt use, while controlling, the existing machinery of Finance.

THE GOVERNMENT AND THE FINANCIERS

The contact between the Government (through the Treasury) and the financier is increasingly close. Loans are frequently raised by the Government and the collaboration of *Financial Experts* is constantly needed in their dealing with foreign countries.

A classic instance of the part played by the financier is the financing of the purchase of the controlling interest in the Suez Canal, by the British Government, when Disraeli was Prime Minister. The Government obtained the necessary money for this purpose through one of the leading financial houses in the city of London. There can be no doubt that the Government of the day would not have been in a position to purchase the controlling interest i.e. the bulk of the shares, in the canal, had not the matter been dealt with in the city as a financial enterprise, offering a field for investment. The financier is here seen playing a vital part in Imperial policy.

The Financial Corporations arranged the loans which financed the First World War. They played an important part during the period between the two wars in bringing about the currency agreement between U.S.A., Great Britain, France and Scandinavia. They also were in-

strumental in financing the recovery of Germany's heavy industries.

From the point of view of the community, the function of the financiers might be described as directing the nation's surplus wealth into productive channels. That they sometimes direct wrongly is to be expected. They are human like the rest of us. That they sometimes keep capital unproductive through timidity is also true. Whether or not their functions are exercised by the Government or under Government control the fact remains that behind the manifold activities described in our last chapter is the invisible, indispensable force of Finance without which Industry, Commerce and Trade could not function.

Groups of men sit in their offices hidden away in the great cities of the world. A continuous stream of money is flowing from all points of the compass through their hands, and is diverted by them into various channels in Industry, Trade and Commerce *for good or evil, for better or for worse.*

THE STOCKBROKER

Possibly you, or somebody you know, has saved up some money and wants to invest it. What does this mean? "Invest" is lending money at interest. You have a friend on the Stock Exchange. You consult him. He asks you whether you want a "gilt-edged" investment, or a sound "industrial," or a speculative investment. You decide to take a reasonable chance on something apparently sound and paying a good dividend. Your broker tells you that the Blankshire Windscreen Wiper Development Company are making a fresh issue and suggests that you pick up a couple of hundred £1 shares (ordinary) which are on the market at 21s. He tells you these people have for some years been paying a *dividend* of 8% to 10% on ordinary shares, so you will expect about

£16 per annum interest on your investment. You will have to pay over to your broker £210 plus his "brokerage" (i.e. his remuneration for the work he does for you). He will buy two hundred £1 shares in this company for you and pass over the share certificates to you. You are now a shareholder in this company.

The brokerage charged is fixed by the Stock Exchange Committee and varies from 5s. to 10s. per £100 according to the class and amount of the investment.

Now, if your broker has been wise in placing your money for you, you may find that the company is very successful, its dividends increase, and perhaps in a year's time you are getting 15% on your money and the shares have, owing to the high dividends, become very popular, and have appreciated in value. A £1 share may now be worth £1 10s. on the market, and if you decide to sell your holding of 200 shares you will receive £300 for it. Thus, in addition to the dividends received during the year you will have turned your £210 worth of savings into £300 (less brokerage) in the course of 12 months. Your broker has served you well. Of course this cannot be expected always to occur.

THE STOCK EXCHANGE

These channels radiate from the *Stock Exchange*.

The *Stockbroker* buys and sells stocks and shares on behalf of his customers and is remunerated by a commission which he charges known as *Brokerage*.

The *Jobber* differs from the broker, he does not deal directly with the public; he is not an agent, but buys and sells shares off his own bat, and makes his profit on the difference between the price he gives for the shares he buys and that which he gets for those he sells.

The *Stock Exchange* itself is really a market-place where the members meet for the purpose of buying and selling shares.

At the beginning and in the middle of each month

occurs what is known as the *Account*. This is a periodical settling up between the various members of the Stock Exchange and their clients. The first day of the Account is known as *Carry-over Day*, the second *Ticket Day* and the third *Account Day*, which is the day of Actual Settlement.

Carry-over Day is devoted to making arrangements for carrying-over to the next settlement payment for securities purchased, and also for carrying-over deliveries of securities sold. On *Ticket Day*, the brokers issue the names and descriptions of those who have bought stock, and pass them on to the firms who are to hand over the stock to the purchasers. On this day tickets, giving details of the transactions, are exchanged between the purchasing brokers and those who hold the stock.

A *Bull* is a dealer who buys in the expectation that the price of shares purchased will rise.

A *Bear* sells and causes prices to fall and later buys back what he has previously sold at higher prices.

A *Stag* is a person who buys shares in a new company with the object of selling them at a premium.

Stocks and Shares are the materials with which the Stockbroker works.

Money subscribed with a view to starting an enterprise can be in the form of stocks and shares. If you invest money in a company you are a joint-owner of the capital of the company along with a lot of other people. The value of your stocks or shares will, of course, increase or decrease as the fortunes of the company progress or decline. The difference between holding stocks and holding shares is as follows :

Stock can be held in any amount, but shares can only be held in a fixed ratio to the total capital. If you are buying stock, you can hold any amount according to what you buy, i.e. £50 or £375. Shares must, however, be bought in multiples of a fixed sum, i.e. one 10s. share or one hundred 10s. shares, according to the nature of the issue.

An enterprise where the capital is thus supplied by a

number of people, and owned by them jointly, is known as a *Joint Stock Company*.

Ordinary Shares differ from *Preference Shares* and *Debentures* in that the holders are entitled only to the profits of the company left over after the Preference and Debenture shareholders have been paid.

Preference Shareholders are so called because under the terms on which they invested their money in the company they are entitled to be paid a fixed rate of interest before anything is paid to the holders of ordinary shares.

The difference between a *Debenture* holder and a Shareholder is that the latter is a proprietor of the company, whereas the debenture holder is a creditor. The debenture holder has actually lent money to the company, and has the ordinary rights of a creditor holding a first charge upon the assets of the company.

Contango is a Stock Exchange term. It frequently occurs that a man who is speculating in shares desires to acquire a block of shares, but is not quite ready to pay for them. He finds somebody who is willing to buy these shares, and, at the same time, is willing to bind himself to re-sell them to the speculator at the price quoted for those particular shares on *Carry-over Day*. The speculator naturally has to make a payment to this purchaser in consideration for his promise to re-sell. This payment is known as *Contango*.

Backwardisation is a premium paid on stock which is borrowed by a "Bear." We have elsewhere defined the meaning of this term, and it will be remembered that a "Bear" buys when prices have fallen. At times he is willing to pay a premium for the privilege of holding stock back from the market.

THE GOLD STANDARD

We are all familiar with the term "*The Gold Standard*." Gold was for a long time the foundation upon which stood the complex structure of international Trade and

Finance. The reason is that the public regarded gold as something valuable and precious, the possession of which ensured a share of the world's goods. Even now gold will always be accepted as payment for goods or services. Confidence in paper money was based largely upon the faith that it could be converted if necessary into gold. This mental attitude affected the freedom with which capital was invested, and Governments and Financiers, in consequence, closely watched the gold situation.

It will help us to understand the meaning of the Gold Standard if we realise something of its history.

In the middle of the seventeenth century gold and silver coins were circulating in this country side by side, but there was no fixed ratio between their values. Towards the end of that century, however, the Government decided to fix the ratio of the gold to the silver coin. One guinea (gold) was made equivalent to 22s.

In 1717 the legal tender value of the guinea was fixed at 21s., and in 1718 it was decreed that the gold guinea should be permanently fixed at 21s., and furthermore, that the amount of gold in a guinea and the amount of silver in a shilling should remain unchanged.

It was, however, not possible to control the rate of production of the two metals. Whenever an acceleration took place in the production of gold from the gold mines in various parts of the world, thus throwing larger quantities of the metal upon the market, its value, of course, tended to decline. By 1760 this had actually occurred, and the value of silver had risen in relation to gold. The result was that silver coins began to disappear from circulation. Why was this? If a man possessed 100 guineas he could get in exchange for them 2,100 shillings. With 2,100 shillings, however, gold having decreased in value, he could buy enough gold to make 107 guineas. It naturally, therefore, paid him to turn his silver shillings into gold guineas. Most people, in consequence, exchanged their silver money for gold

money, and silver coins began rapidly to disappear. This tendency is known to Economists as *Gresham's Law*, viz. "Bad money drives out good money."

It should be noted that this was only possible under conditions where anyone in possession of a quantity of silver or gold could take it to the Mint and have it converted into the appropriate amount of coinage.

Silver continued to go out of circulation for a time, and then the tide turned, and the ratio of production of gold to that of silver decreased, with the result that by 1800 silver was driving gold out of circulation.

In 1816 the Government finally stopped the free coinage of silver, and gold became the standard currency of the realm. *England had adopted the Gold Standard.*

We have heard a lot in recent years about England going off the Gold Standard. It is necessary to distinguish between the use of the Gold Standard internally, and its use in foreign trade. During the First World War, England went off the Gold Standard; in 1925, she came on to it again, and in 1931 went off it once more. Whilst the Gold Standard was in force the foreigner could always obtain gold from London if he wished, provided he held the necessary credits upon this country. When we went off the Gold Standard this meant that no export of gold was allowed. The immediate effect was that the value of the pound in foreign currency decreased, the price of English goods in foreign money declined, and the English exporter began to find increased markets for his goods. The purpose of the Government was thereby achieved, the balance of trade, which had been against this country, was adjusted.

THE FINANCIAL CRISIS OF 1931

The Financial Crisis of 1931 was brought about more by a loss of confidence on the part of the British people themselves than by Great Britain's trading position in relation to foreign countries. A huge budget deficit began to

loom, and serious fears were entertained as to possible heavy losses to British investors in foreign countries, owing to the threatened insolvency of certain important European nations. There is no doubt that British financiers were at that time heavily involved in the affairs of Europe. The result was a run on the pound. The Bank of England endeavoured to restore confidence by borrowing short-term assets from abroad. But it became necessary to prohibit the export of gold.

When Great Britain went off the Gold Standard, her example was soon followed by a number of other countries whose trading relations with her were extensive. The Scandinavian countries and some of the British Dominions chose the pound sterling as the standard upon which to base the values of their various currencies, and, as a result, grouped themselves for trading purposes around Great Britain. Subsequently France and the United States came to agreements with Great Britain with a view to fixing the value of their currency in relation to the pound.

FOREIGN EXCHANGES

What is meant by the expression : *Foreign Exchanges* ?

As a result of international commerce the merchants in one country become indebted to those in foreign countries. In order to avoid the cumbersome process of sending coin, they seek other merchants in the same country to whom similar amounts are owing from the foreign countries in question, and, buying up those debts, assign them to their foreign creditors. If the aggregate sums owing by the merchants in one country to those in another were equal, there would be no difficulty and there would be no fluctuations in the foreign exchanges between the two countries involved. Technically this is described as "*Exchanges at Par.*"

On the other hand, the fluctuations which do occur, and with which we are all familiar, are an indication of the

variations in indebtedness which occur from time to time between the merchants of different countries. It is the cancelling of this indebtedness which renders it necessary for payment to be made by the debtor country to the creditor country in the currency of the latter.

It will be appreciated that the exchange value of the pound in foreign countries is closely watched by the Government and its Financial Advisers. It is equally obvious that merchants are deeply interested in the amount which the pound will fetch abroad in foreign currencies at any given time. Similarly, it is in their interests that the value of the pound abroad should be as stable as possible. Trade is gravely hampered by fluctuating currency values. Hence the virtual stabilisation of the pound in America, Scandinavia and France, which resulted from the agreement referred to in a former paragraph. (*See Appendix II.*)

BANKS

We are all familiar with *Banks* as places where we usually have current accounts and may have a credit balance, or an overdraft. If asked, however, to give a fuller account of the function of banks we should probably be at a loss for a satisfactory answer. Actually their functions extend far beyond those which come under the immediate notice of the average citizen. Probably the most important of their activities is that of providing a Clearing House in which the claims of traders upon each other are brought together, cancelled out and settled.

How many of us realise that before it is possible for a man to buy a collar, the banking system has to provide credits to enable the sowers of flax and the engineers who make the machines which manufacture the collars in Leicester to be paid their wages? And this is not by any means the whole of the picture. What about the ships and the railways which carry these goods? The com-

plicated machinery of credit banking lies behind all these things.

SLUMPS AND BOOMS

What is a *Slump*? It is a period of trade depression, when prices fall, profits fall, wages fall, unemployment begins to loom large; there is general anxiety, and lack of confidence; trade contracts and incomes decrease. The opposite of a slump is a *Boom*. Trade conditions appear to alternate between these two extremes, both of which are unhealthy and disturbing. In order to understand the slump it is necessary to understand the boom. What then is a Boom?

It may be explained as follows. Most people do not spend the whole of their incomes. They probably try to save part of them. With the other part they buy food, clothing, railway tickets, etc.; pay the doctor, the dentist; and provide for amusements such as going to the cinema, and for rent, rates and education. Now what do people do with that portion of their income that they save? They may put it into a bank, or invest it in some industrial enterprise or in some other way.

This investment really means that they have transferred their purchasing power to some other person or persons. These other people thus acquire factories, plant and machinery of all kinds, including materials used in manufacture, and finished products, which are then sold. In order to understand this more fully, we must realise that at any given time the people in a community are engaged in producing a great variety of things, such as food, clothing and so on, and performing all kinds of services for which they are paid. What these people are getting in return for these goods and services they spend and invest, thereby creating a demand for what they help to produce and capital to finance industrial enterprise.

Now the goods produced fall into two main groups: consumable goods, such as food and clothing; and

capital goods, which consist of those things which are required to set up new factories, or make new land productive.

We will suppose that there has been a period of depression, when for various reasons, such perhaps as war or bad harvests, the national income has been low, but that it is now recovering. Incomes will be going up and the demands for goods will be growing. The producers will be wanting more plant, i.e. more capital. The industries producing this type of goods will be stimulated and will require more labour and material. It may be that they will be stimulated too much, and place too many such goods on the market, thereby stimulating consumption to such an extent that the proportion of the national income spent on purchasing consumable goods will become excessive, and people realising this will begin to cut down expenditure, the producers will begin to find that they cannot sell their goods, and prices will fall. People will then restrict consumption and begin dismissing their employees, who, in turn, will be unable to spend so much. Thus a further reduction in production will take place.

Past experience seems to show that this state of boom and slump recurs at intervals, and it has hitherto not proved possible to prevent it. Since the big slump of 1931, economists have been investigating this problem very carefully in order to see whether it is possible to prevent slumps by checking booms as soon as the evidence appears that they are approaching. The method by which this has been attempted has been the raising of the Bank Rate. The reason for this method of attempting to check a boom is that by raising the Bank Rate you are raising the interest charged on borrowed money. Factories, plant and machinery and capital goods generally are paid for out of borrowed money, and it is held that this would act as an automatic check on production and prevent a boom from developing.

It cannot be said that this method has been successful

in preventing booms and slumps, but it may have slowed down the process, and made them less disastrous than they would otherwise have been. In Great Britain it is hoped that the control of production and investment by the Government will have the desired effect.

FREE TRADE AND PROTECTION

At one time controversy raged between politicians and economists as to the relative merits of these two systems. It was held, and rightly held, at the time when Great Britain's industrial supremacy over the whole world was unchallenged that Free Trade was the right policy for her. To-day few would deny that if the nations of the earth co-operated for the benefit of humanity as a whole, Free Trade would be the only sound policy.

The Anglo-American Trade Agreement of 1938 was a step in the direction of restoring freedom of trade between Nations. Under this Agreement a large number of commodities from Britain are allowed to enter the United States at a much lower import-duty rate than hitherto, and reciprocal advantages were given to the U.S.A. by Great Britain.

This agreement has since been modified and simplified by the Havana Charter of 1948.

CHAPTER VII

COMMUNICATIONS

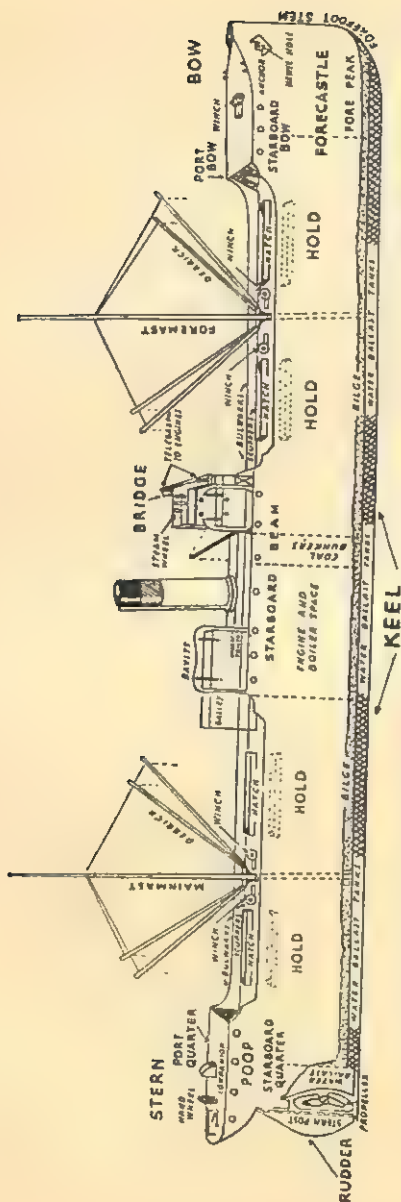
Recent Improvements—The Motor Engine—Road Transport—Motor Transport and the Building Industry—The Air—Airships—Helium—Petrol Engines and Diesel Engines—Communication of Ideas—Wireless—Wireless and Nationalism—The Press.

RECENT IMPROVEMENTS

THE word "communications" has a variety of meanings, and suggests an amazing multiplicity of human activities. It is in this sphere, perhaps, more than any, that science has effected a vast improvement. If we look back over the last two thousand years, we realise both the suddenness and the tremendous extent of the revolution in communications which have taken place in the last century. In the year 1800, the roads of England were definitely inferior to those of Imperial Rome at the beginning of the Christian era. A king of England, on the way from Windsor to London, had to abandon his coach in the mud.

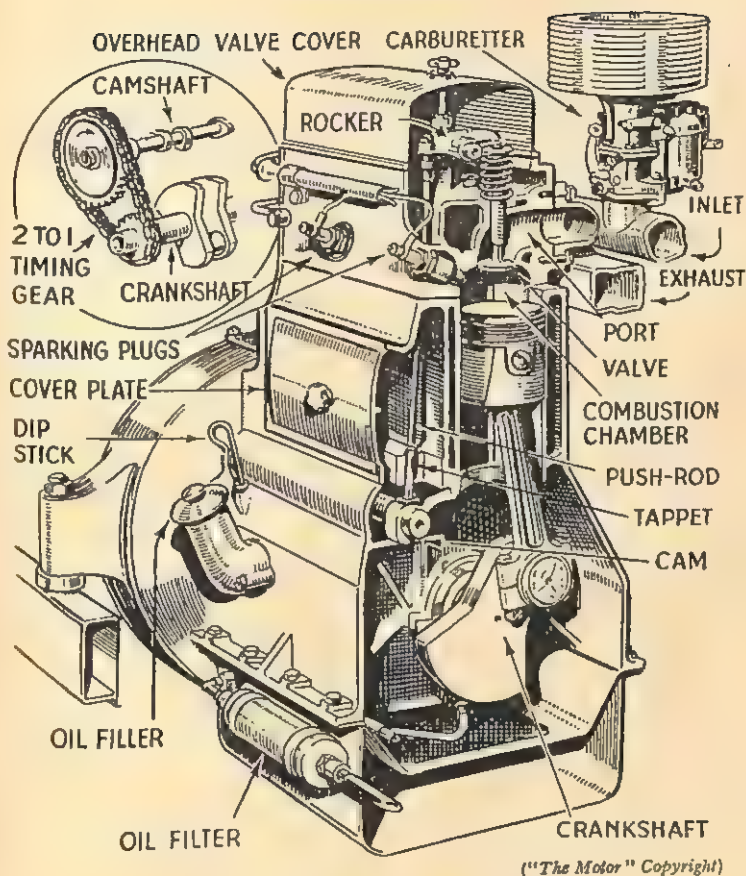
Transport by sea was certainly superior to transport by land, but was still dependent upon wind and sails and was relatively slow. Communications between distant parts of the earth made no real progress for nearly two thousand years, until the introduction of railways and the electric telegraph. It is true that, during the Napoleonic Wars, messages were sent by semaphore from the south coast to London in about a minute, but this was really only the same kind of thing as the drum signalling of the African natives.

It is, of course, a commonplace to point out that the



(Thos. Nelson & Sons, Ltd.)

This Diagram shows how the Various Parts, Fittings, etc., of a Cargo Boat are named.



("The Motor" Copyright)

A Sectional Drawing of a Motor-car Engine.

introduction of steam caused the greatest revolution in methods of transport which has ever been known. The introduction of Electricity has brought about a further revolution whereby many thousands of miles of railway tracks have been adapted to electrical traction. In the underground electric railways, known as Tubes, we have

also a method of transport unknown during the era when steam was supreme.

THE MOTOR ENGINE

But since then another revolutionary change has taken place, brought about by the discovery of the *Internal-combustion Engine*, which has produced the motor-car, the aeroplane and the motor-ship. Here again we find our scientific researchers at work. It was scientific researches on the properties of gases which led to the idea of using an explosion of gas, or vapour, to drive an engine. The effect of the internal-combustion engine has been almost incredibly far-reaching. Industry after industry has sprung up as a result of motor transport.

ROAD TRANSPORT

One of the greatest of these has been the resurfacing of roads and the construction of new types of roads. Once more the research laboratory appears on the scene. The Road Research Laboratory has constructed an experimental road on which to test different types of road materials. Among other things they are endeavouring to design a machine which will measure road wear.

They are also concerning themselves with the prevention of accidents, a large number of which are due to skidding. Steps are being taken to test the various road surfaces with regard to their skid-causing propensities.

An indirect effect of the rise of the motor industry has been to stimulate the railways into renewed activity. They have suffered considerably from the competition of road transport, and have called in the scientists to advise them as to the best methods of economising in their expenditure upon coal. Simply expressed, the problem was how to make the same amount of coal drive a train farther.

One of the problems to be tackled was air resistance.

If this can be reduced, less power is required, and therefore less coal. It was found out as the result of experiments that the Royal Scot at 60 m.p.h. without any headwind had to develop 400 h.p. to overcome air resistance only. The exact amount of air resistance produced by each part of the train was measured (i.e. engine, tender and coaches). Experiments were then undertaken with new designs to reduce air resistance. So now we have *Streamlining*.

Before the war much new painting of railway carriages was taking place. Enormous saving can be effected by the railways if they can use durable paints. Obviously every time a railway carriage has to be diverted from use on the rails to the repair shop, money is being lost. Not only is money being spent on the painting of the carriage, but the money which the carriage would earn if in use is being lost.

What has this to do with road transport? As already indicated, the competition with the roads by drawing passengers and goods away from the railways made it necessary for them, not only to devise cheaper processes, but also to do everything they can to make themselves more attractive to the traveller. Hence, great improvements in the way of electrification, cheap week-end tickets, period tickets, cheap day tickets, and numerous facilities, most of which were not granted to travellers in the pre-motor days.

Notice also the impact upon the Mother of Parliaments of the advent of the motor-car, as evidenced by the passage of Acts of Parliament dealing with Road Traffic Control. Parliament had to concern itself with the details not only of the regulation of the flow of traffic on the roads, but also with the laying down of codes governing the behaviour of motorists.

MOTOR TRANSPORT AND THE BUILDING
INDUSTRY

An indirect effect of motor transport was the stimulation of building in certain areas. The extensive electrification of the Southern Railway caused great housing developments to take place on the south side of the Thames.

Ribbon development is one of the evils which has arisen from the growth of arterial roads, and, therefore, indirectly from the growth of motor transport; and, going a stage farther back, from the discovery of the internal-combustion engine. It may be said with truth, paradoxical though it may sound, that many a suburb which now clusters around an arterial road, some miles from London, is the indirect result of the explosion of a gas in a cylinder head. These excrescences would have been avoided if the Central and Local Governments had insisted on new building following planned lines.

For a long time the transport system was allowed to develop without any attempt at co-ordination. But in due course the London Passenger Transport Board, which brings under a single control the whole of the communications in the London area, came into being.

THE AIR

It is a remarkable fact that in the short space of half a century, this country has seen the progress of communications from wheeled vehicles drawn by animals, to railways, then to road motor transport and caterpillar tractors on the fields, then to *Aeroplanes* and *Airships*. The effect of the aeroplane is perhaps nowhere so marked as in some of the remoter parts of the globe. Thus, for instance, in some of the mountainous regions of Asia, under the control of Soviet Russia, until recently pack animals were the only means of transport. Then came the aeroplane. It is an

interesting fact that in these remote regions, roads and motor traffic did not begin to appear until after the aeroplane had arrived. A reversal in the sequence of events seems to have taken place there. The reason is that it was only when the aeroplane arrived that the possibilities of these places, from the point of view of productivity, were discovered. As soon as the aeroplane had spied out the land, and the prospectors came along, roads and road transport followed. Once more, we discover a strange remote and yet intimate connexion between two entirely dissimilar events. The discovery of the means of utilising the explosion of a gas has led to the building of roads in hitherto inaccessible mountain regions, in remote jungle-invested parts of the globe.

This same discovery has had shattering reactions in international diplomacy. Elder statesmen think nothing nowadays of jumping into an aeroplane and flying hundreds of miles to have informal chats with other statesmen, involving the fate of the world. Whether or no the aeroplane has in this respect contributed to stability in international affairs, history will in due course decide.

The uses of the aeroplane are surprisingly varied. There are, for instance, the "*Met. Flights*," where aeroplanes, by undertaking flights in the upper layers of the atmosphere, help the Meteorological Office to forecast the weather. Some other uses to which they are put (apart from the normal use for passengers and mails) are Photography for Town-planning purposes, and to assist Archaeological research, Exploration and Film-craft.

The latest development in Aeronautics, the jet plane, is still in the experimental stage but promises far-reaching results.

AIRSHIPS

Hydrogen is the gas which was used for a long time for airships. Then a rival was discovered—helium, which has the great advantage over hydrogen that it is not ex-

plosive when diluted with air. Hydrogen is exceedingly explosive. The difficulty is that helium is scarce and very expensive.

Great Britain abandoned airship construction after the disaster to the *R101*, which was due to the use of hydrogen, just as was the destruction of the *Hindenburg*.

HELIUM

The United States of America used helium in their naval airships for some time. Considerable supplies of helium are to be found in that country, where it is produced from gases obtained in oilfields, and has to be compressed into steel cylinders for transportation. The cost of inflating airships of the size of the *Hindenburg* with helium is very great, and makes its use commercially almost prohibitive. Another disadvantage of helium, in addition to the cost and scarcity, is that its lifting power is 7% less than that of hydrogen. Even if helium could be made a satisfactory commercial proposition, the airship can no longer compete with the large flying-boat on ocean crossings.

The average time taken by the *Hindenburg* was three days. The *Queen Mary* and the *Normandie* do the journey in less than five days, and when you consider the enormously superior comfort and safety offered by these great liners, as compared with the airship, it seems that nothing but the vastly greater speed of the flying-boat can compete with them. The flying-boat has crossed the Atlantic in less than 12 hours. It is only fair to the airship to mention one great advantage which it does possess over both the liner and the aeroplane, and that is its smooth and silent movement through the air and lack of vibration. But the larger the flying-boat becomes the smaller will become this disparity. Another point which can be urged in favour of the airship is its greater radius. But this does not really operate very strongly against the flying-

boat when you consider that the flying-boat can cross the Atlantic in one flight, and during a single night.

PETROL ENGINES AND DIESEL ENGINES

The peculiar characteristic of a *Petrol Engine* is that a mixture of air and petrol vapour is sucked into the cylinders and exploded by an electric spark. In the *Diesel Engine* the air and the fuel are introduced into the cylinder separately under pressure. No form of sparking is necessary, for the mixture explodes of its own accord under the pressures used. Great progress has taken place in the efficiency of the Diesel engine, which burns heavy oil—a great economy.

Some of the finest liners in the world are run on oil, which has many advantages over coal. It will be noticed here that Great Britain's virtual monopoly of fuel in the form of coal no longer exists. This, no doubt, has been one of the factors in the ratio of British shipping supremacy. Other important factors have, however, also operated, such as the growth of Nationalism, and the subsidising of their Mercantile Marines by foreign Powers.

A difficult problem which has not yet been solved is the question of the manning of British ships. It is well known that a high percentage of the crews are of foreign nationality. This is due to the lower standard of living abroad, and the fact that British seamen require a much higher wage.

COMMUNICATION OF IDEAS

We are now going to deal with another type of communication, viz. Mind to Mind. A change took place some five hundred years ago in the communication of ideas. This was the discovery of printing. No doubt, by facilitating the interchange of ideas all over the Western world, it helped to lay the foundations of those

scientific developments which have played so important a part in modern life.

WIRELESS

In modern times communication at a distance was at first accomplished with the use of wires, but is now accomplished by means of wireless apparatus. The latest development of this is *Television*. Probably the two most far-reaching scientific discoveries affecting this type of communication were the discovery of long ether waves, and of the photo-electric properties of metals.

The long ether wave was discovered by Hertz. This gave birth to wireless communication with its myriad voices speaking from the void. The various stages of its development were the sending of Morse messages, the

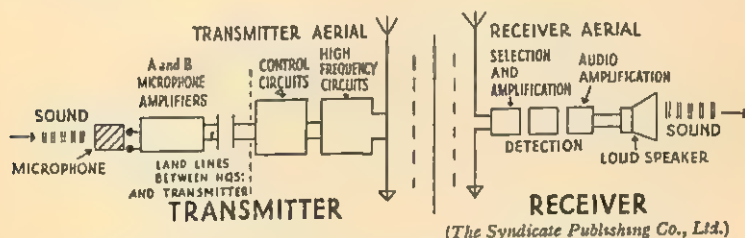


Diagram showing the Various Parts of a Broadcasting System.

transmitting of music and the human voice, broadcasting, and the introduction of short-wave systems making it possible to transmit messages the whole way round the world. Far-reaching advances, including Radio-Location, have been made during the Second World War.

Our invisible link crops up again here. A great advance has recently taken place in our knowledge of the upper layers of the earth's atmosphere. There is a close connexion between this and the discovery of short-wave transmission.

It is an interesting reflection that the extraordinarily rapid development of this new method of communication between people may, in the long run, tend to slow down the use of the other means of communication, such as the motor-car and the aeroplane. When you can sit in your home and hear what is going on all around the world, and may soon commonly see what is going on, perhaps there will be less incentive to go rushing round the world in motor-cars, aeroplanes and ships.

Thus we have two opposing tendencies in the evolution of communications; one stimulating the wanderlust, and the other putting a brake on it.

WIRELESS AND NATIONALISM

Another far-reaching effect of this intangible thing, wireless communication, has been that it has given a great stimulus to national life. At first sight it might appear that wireless communication would tend to promote an international outlook. It has, however, been utilised by certain Governments to promote an intensely nationalistic point of view. Where Governments take control of broadcasting, it can, of course, be a very powerful weapon in this direction. Illustrations of this are the tremendous influence exerted in this way by Hitler and Mussolini.

The powerful influence on the electorate, which broadcasting confers upon a statesman, has been demonstrated by President Roosevelt.

We see, therefore, that wireless communication operates in two different directions; one towards uniting people all over the world, and the second towards separating them if those in control of the broadcasting systems wish to do so. It is possible to conduct hostile propaganda over the ether just as it is possible to conduct peaceful propaganda.

THE PRESS

No less powerful than the influence of wireless communication is the influence wielded in modern times by

the *Press*. The nature of this influence varies with the political character of the countries in which it is exercised. Thus in democratic countries, such as England, France and the United States of America, the newspapers are free to express any opinions they choose on all subjects, and to publish any facts. In autocratically governed countries, the *Press* is strictly controlled by the Government, and only publishes those opinions and those facts which are acceptable to the authorities.

In Great Britain the different types of newspaper fall into certain readily defined groups. There are the National Dailies, the Sunday Newspapers, the Provincial Dailies, the Weekly Newspapers, the Illustrated Journals and Periodical Magazines.

The dailies are the principal purveyors of news and these again fall into two main groups. On the one hand there are the newspapers which are associated in the public mind with the avoidance of sensationalism, and a sober and dignified treatment of politics, general news, literature, drama and art. On the other hand there is the group which depends for its popularity upon entertaining the public with the most sensational and melodramatic material at its disposal. These papers usually take a somewhat violent partisan line on political questions.

For further information upon this important subject the student is advised to consult the Bibliography at the end of this chapter.

EXAMINATION QUESTIONS

1. Point out the advantages and disadvantages which might be expected from Free Trade within the Empire.
2. Describe the phenomena which usually accompany a volcanic eruption, and point out which regions of the world seem to be most liable to suffer from volcanic activity.
3. To what causes would you attribute the decline in the unemployment figures in this country during 1936 and 1937?

4. Much foreign labour is employed in British ships. Why is this? Is it desirable? Discuss.
5. Discuss the problem of the settlement of workers on the land in this country.
6. Discuss the relative advantages and disadvantages of gold and paper as standards of currency.
7. Explain the differences between ordinary shares, preference shares and debentures, and discuss their relative advantages to the holder.
8. An Act of Parliament now requires applicants for motor-driving licences to undergo a test in driving, and requires them, if licensed, to take out an insurance policy against third-party risks. Discuss briefly the arguments in favour of and against each of these requirements.
9. What has been the effect of the nationalisation of certain parts of the road traffic industry?
10. Write a short account of the usual route taken by fliers from England to Australia.
11. What explanation would you give of the great increase in the number of unemployed in this country in 1931?
12. Give arguments for and against the electrification of the long-distance railways in Great Britain.

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PART II

SCIENCE AND HUMAN LIFE

CHAPTER VIII

SCIENTIFIC MANAGEMENT IN INDUSTRY

Rationalisation—Scientific Management—Mass Production—Science and Industry—Synthetic Products—Coal—Hydro-electric Power—Scientific Research—Waste Products—The Moving Conveyor—The Miner's Safety Lamp—Disease—Industrial Psychology—Industrial Fatigue—The Problem of Noise—Occupational Tests.

RATIONALISATION

IN order to understand the meaning of *Rationalisation*, it is necessary to grasp the significance of another term, viz. *Scientific Management*, which in general terms means the substitution of systematic knowledge and research for guesswork and haphazard experiment. To-day, Business Management has become a definite subject of scientific research. As a result certain definite principles have been evolved and rules laid down. Under the antiquated systems of business each member of the management of a concern attended to a multiplicity of different functions. Under scientific management each member specialises on a small number of managerial duties.

SCIENTIFIC MANAGEMENT

Scientific Management is also applied to the employee. The best methods of running the concern are carefully investigated and each employee receives a careful training in those methods. He is provided with the tools, implements or instruments which research has shown to be best adapted to his particular class of work. He is in-

structed even in movements. Under the old-fashioned methods employees were engaged haphazard, given a trial, and discharged if unsuitable. Under scientific management, before an employee is engaged steps are taken to ascertain as far as possible what are his qualifications, and he is set at once to the work in which he is likely to prove most successful. Wages are based upon efficiency and are regulated in a manner likely to serve as an incentive to production.

Rationalisation is a natural development from, and companion to, scientific management. It deals with the larger problems of business, and its external relations and developments. It aims at eliminating wasteful competition. One of the methods by which this is accomplished is the purchase and suppression of weaker industrial concerns. Rationalisation proceeds side by side with the establishment of combines. When several large business undertakings get together and decide to "rationalise" with a view to eliminating wasteful competition, they ration the output of a given product for each member of the combine. They fix the areas within which they are going to sell the common product, thus abolishing cross-sales and the superfluous duplication of work involved. They agree upon a common price for the sale of the article, they establish a common costing system, and joint arrangements for the purchase of raw material and for the marketing of their products. They spread over the whole combine any losses incurred through such developments as cross-cutting in the export trade and they pool the results of technical, commercial and economic research.

Rationalisation is not an unmixed blessing for the community. It eliminates competition and makes for monopoly.

MASS PRODUCTION

Hand in hand with Rationalisation and Scientific Management goes *Mass Production*. Under this system

each employee works on one job all the time. Here we encounter the other side, that is to say, the darker side of these modern developments of business. One of the effects of mass production is that work becomes mechanical and monotonous. The monotony and complete lack of interest produce stagnation and fatigue. The man, instead of being a craftsman taking a pride in his work, becomes an automaton, a robot, and even if he is doing somewhat superior work as a machine controller, the strain involved in constantly watching the machine and attending to its maintenance and adjustment is not compensated by any pleasure of achievement or creation, such as was experienced by the craftsman. Another disadvantage of this method of production from the employee's point of view is that these great modern concerns owing to their sensitiveness to world movements are more subject to fluctuation in their demands for labour than the smaller businesses of old, and furthermore, that there is a constant tendency to replace manual labour by machines, thereby creating unemployment at least temporarily.

SCIENCE AND INDUSTRY

It is the practice of the large modern combines to entrust to a special department the work of investigating the *application of Science to Industry*. Many of them have a special industrial research laboratory. Frequently trade associations such as, for instance, the Cotton Industry Research Association conduct their laboratories on co-operative lines. Similar research associations exist in connexion with the British cotton, woollen and worsteds, scientific instruments, rubber, leather, boots and shoes, electrical and other industries. The British Department of Scientific and Industrial Research encourages industries to conduct their own research on co-operative lines, by offering subsidies. This department also assists

and encourages research in University Laboratories.

The Second World War has produced far-reaching results. The Department of Scientific and Industrial Research has been expanded far beyond its pre-war establishment. The Government has gone into this in a big way, and intends to continue. The following are some of its more important research activities : building, chemical food, forest products, pest-infestation, road development, water pollution, physics, light, electricity, radio, metrology, engineering, aerodynamics, metallurgy, geology.

SYNTHETIC PRODUCTS

Synthetic Products are increasingly coming to the fore. Research chemists and industrial laboratories are busily engaged upon the study of the possibilities of these products. There are very few natural products which are not liable to competition from synthetic commodities. Camphor, for instance, a product of China and Japan, is now manufactured synthetically in the United States of America. Other synthetic products, which have been substituted for the natural commodity, are artificial silk, resin, lacquer and celluloid. Artificial indigo is ousting natural indigo from the world's markets. There has been an immense increase during the war of the manufacture of synthetic rubber. One of the great advantages of the synthetic over the natural product is the ease with which the supply of this commodity can be adjusted to meet the demand.

COAL

One of the great services rendered by science to industry has been a tremendous increase in productive power.

The increase in the use of coal for power, gas generation, iron smelting, domestic and other purposes during the last 100 years has been tremendous. The production has

in fact increased in the ratio approximately of 50 : 1.

In Great Britain alone, since the middle of the nineteenth century, the output of coal has been increased by 300%, in America during the same period by about 3,000% and in Germany by about 1,000%.

HYDRO-ELECTRIC POWER

Another direction in which great developments have taken place is in the use of *Hydro-electric Power*. From very early times water power has been used for driving mill wheels. The discovery of electricity and of the turbine rendered possible the use of water falling from a height for the purpose of generating electrical energy. This discovery made it possible for mountain rivers and waterfalls to be used for creating power to carry on manufacturing industries in countries which had previously depended upon the importation of coal for creating heat, steam power and gas. Hydro-electric power is now in use on a large scale in Switzerland, Italy, Sweden, the United States of America, Germany, Canada, New Zealand and the Irish Free State, where the River Shannon has been utilised for the generation of electrical power. Agricultural industry has similarly benefited in Germany, Sweden and Switzerland.

SCIENTIFIC RESEARCH

Another result of Scientific Research, which has led to great developments in the industrial sphere, was the discovery and development of the Internal-combustion Engine. At least three colossal industries have arisen from this cause, viz. the Motor-car Industry, the Aeroplane Industry and the manufacture of Oil-driven Ships.

The following examples show how profoundly scientific research has influenced the production of this world's goods.

Experiments by Thomas & Gilchrist in the smelting of

iron which contained phosphorus have rendered possible for the immense quantities of iron in the Minette Mines of Lorraine, Luxembourg and the vicinity to be used. Fifty years ago, this minefield was of very little value, but in 1939 it was the most important in the world, with an output three times as great as that of Great Britain, and almost equal to that of the United States of America.

Another illustration is to be found in the utilisation of beet for sugar production. At one time it took 25 lb. of beet to make 1 lb. of sugar. Now, as a result of scientific research, 6 lb. of beet yield 1 lb. of sugar.

WASTE PRODUCTS

An interesting development in connexion with this industry in the United States is the use of the waste products of beet. In that country beet packing has become a separate industry. Research was instituted into the possible use of waste products, with the result that every ounce of waste product is now used in some profitable manner.

The use of waste products has recently been the subject of extensive scientific researches in most highly developed industrial communities, and the following are a few illustrations of the way in which commodities can be manufactured from these by-products.

Horns and hoofs yield glues, buttons, hair-pins, cyanide and chrome. The albumin in the blood of animals killed in the slaughter-houses yields printers' ink, and is used by tanners to finish leather, and by sugar refiners to whiten their products. Rich nitrogenous fertilisers have been manufactured from dried blood, bones, tankage and the ground waste of hoofs and horns. Gas, coke and dyes have been developed as by-products from residuals on a large scale. These are only a few illustrations and could be indefinitely multiplied in regard to industry as a whole.

Examples of the influence of scientific research upon the

improvement of mechanical appliances are so numerous that we will confine ourselves to one case which is of general application.

THE MOVING CONVEYOR

The Moving Conveyor has produced a tremendous advance in production owing to the acceleration which it has effected in the automatic distribution of the parts of a commodity.

There are two chief types of conveyor—those on which work is actually performed and those used for the collection and distribution of finished products. The speed of the conveyor can be regulated and the whole pace of the work in a factory increased or diminished at will. Conveyors on which the assembling of parts is done are carefully timed to ensure an even output over the whole factory. This device, like so many others, tends to reduce the cost of production and increase output, but it also makes for a reduction in the number of persons employed.

THE MINER'S SAFETY LAMP

Another sphere in which scientific research has conferred benefits upon millions of people is that of minimising the danger from explosive gases in the mines. The classic instance of this is Davy's Miner's Lamp. As a result of this discovery millions of people have been enabled to find employment which, but for this device, would have been too dangerous. It would have been impossible to penetrate as deeply into the earth as has been done, had it not been for this contrivance.

DISEASE

The discovery of the Davy safety lamp has led to other discoveries which have improved the lot of the miner. Explosions are not the only dangers to which these workers are exposed. Disease has taken a heavy toll. One of the worst has been "miners' nystagmus." This attacks the

central region of the eye. It is a very serious complaint and very distressing, involving headaches and low-spiritedness. Here again, research has stepped in, and has discovered that it is almost entirely the result of insufficient light. The doughty research students there-upon made it their business to evolve a bigger Davy safety lamp giving out much more light, and it is expected that within a few years miners' nystagmus will disappear.

Another disease from which the miners suffer is miners' cramp. The heat of the atmosphere in which they work causes severe perspiration. When we perspire, in addition to the moisture which comes out of our blood through the pores of the skin, salt emerges. If we perspire excessively our blood becomes depleted of salt, and cramp follows. The remedy for this is to drink water in which salt has been dissolved. This has been found successful as a preventive.

INDUSTRIAL PSYCHOLOGY

The Government is showing an increasing interest in the conditions under which people are working. Employers are also, as we have already indicated, finding it in their interests to devote more and more attention to this problem. The Industrial Health Research Board, working under the Medical Research Council, is doing very important work in the sphere of Industrial Psychology.

One of the lines of research concerns occupational neurosis. What do we mean by this? We mean worry, and nervous breakdowns, caused by the conditions under which people are working. This means that we have now got beyond physical industrial diseases, and are now tackling diseases of the mind induced by industrial conditions.

It is realised that the health of the worker depends as much upon the state of his mind as upon that of his body. All employers desire to reduce absence through sickness,

which reduces turnovers and increases costs. Absences due to sickness are frequently indirectly induced by mental states.

Our Victorian ancestors would no doubt be very shocked, and consider that we are carrying coddling to the extreme limits of absurdity, when we are actually so "soft" as to study the mental as well as the physical need of our workers. If they only knew how unutterably wasteful were their own callous methods, they would realise that the more humane modern ways are, in the long run, far more profitable.

An interesting feature of industrial psychological research is that connected with the effects of motor driving on the individuals concerned. Experiments are being conducted with a view to testing people's capacity in this direction, and discovering their reactions. Thus, one experiment ascertains how quickly your eye will register objects coming within the line of vision while you are driving, and, at the same time, your response in guiding, or accelerating, or slowing down will be noted.

Another series of experiments is directed towards assessing people's capacity for concentration.

INDUSTRIAL FATIGUE

Very extensive researches are being made into the problems connected with industrial fatigue. An interesting instance of this is the discovery that it is discouraging to a worker not to be able to visualise the end of his job. As a consequence the aim should be to divide the work out in such a way that the worker knows that he or she will be able to complete a particular job in a particular time. This has been found to have a definitely encouraging effect and even in certain instances has resulted in doubling the output.

The value of rhythm in reducing fatigue and monotony has now been definitely established. Thus it was found by experiment that a considerable increase in output took

place when the workers loading a mechanical conveyor with boxes were instructed to put the boxes on in groups several at a time with pauses in between. This gave the operation a certain rhythm and broke the monotony.

Cases have occurred where the effect upon workpeople of their transfer from an old, dark, antiquated factory into a new factory built of steel and glass, and standing in open country, has been a marked gain in their health, happiness, efficiency and output.

THE PROBLEM OF NOISE

Noise is undoubtedly one of those products of industrial civilisation from which it is difficult to escape. It is to be found in all its intensity in factories, railway stations and streets. Machinery, motor-cars, aeroplanes, sirens and the innumerable technical devices with which we are surrounded on all sides join in making our modern world a very noisy place. Noisiness used to be a special characteristic of large cities, but in these days of arterial roads it has now invaded the country.

There is no doubt that, from the medical point of view, excessive noise is a bad thing. It produces nervous strain and consequent premature tiredness. It is impossible to do effective brain work in noisy surroundings. It is not only factories and workshops that are noisy. A large office is just as bad with its voices, its typewriters, its calculating machines and book-keeping machines, its opening and closing of doors and rustling of papers.

The scientific mind has of recent years been concentrating on this problem. Attempts are being made to make the latest offices sound-proof when they are built. Experiments are being made with a view to reducing the sound in the Tubes and the Underground. Motor horns can no longer be used in built-up areas at night.

The introduction of radio sets into nearly every home has further complicated the position. It is difficult to see how this can be got over, excepting by sound-proof con-

struction of new houses and flats. Apparently human beings, or some of them at any rate, have the faculty of accommodating themselves to these new conditions. Most of us will have observed how in certain households the radio is left on all day, and the inhabitants are able to carry on lengthy and animated conversations with a complete disregard of its existence. Where this immunity from the effect of sound appears among workers in factories who are able to converse in ordinary tones in the midst of the overwhelming din of machinery, it is doubtful whether the immunity is fundamental, and it is not unlikely that these people are suffering from serious loss of nervous energy.

OCCUPATIONAL TESTS

An important recent development in the science of Industrial Psychology is the application of *Occupational Tests* to boys and girls leaving school, with a view to helping them to find suitable jobs. It is frequently found that the job for which they are fitted is entirely different from that which they themselves, or their parents, have suggested.

Tests are applied to ascertain the degree of skill in the use of hands, ability in mechanical work, clerical work, the solving of problems and general intelligence. Temperament charts are also constructed in order to estimate such qualities as initiative, perseverance, etc. It has been found by experience that the children who have taken jobs indicated by the tests have held their jobs longer than those who have not followed this line. This is confirmed by the opinions of employers.

From the employers' point of view, the tests are also valuable, as they enable them to select from among the candidates for a particular job those best fitted for its performance. The Army authorities have found these tests useful in finding suitable men for driving tanks, and for acting as Army signallers. The tests have also been found useful by the Royal Air Force.

CHAPTER IX

SCIENCE AND INDUSTRY

Clothing—Tanning—Textile Processes—Leather, Wool and Cotton—The Wool Research Association—Science and the Moth—Various Experiments and their Results—Artificial Silk—The Science of the Soil—Animal Breeding and Nutrition—Mechanism and Agriculture—Forestry—The Grid—Plastics—Metals—Creep.

CLOTHING

CLOTHING is something that we all tend to take for granted, to regard as inseparable from ourselves as our skin. At the same time, many people, when they talk of the necessities of life, confine themselves to food, forgetting that, at any rate, in a civilised community in the temperate regions of the globe, clothing is just as much a necessity of life as food. It is a necessity, not only because it would certainly be impossible for any of us to survive for long in the climate of Northern Europe without it, but because it is an accepted tradition of civilised life that clothing must be worn; and not only that it must be worn, but that it must conform to certain standards. In this respect, in Europe at any rate, men are more strictly governed by convention than women. Very little variation in the type of clothing that he wears is permitted to a man. A considerable degree of variety, both as regards colour, form and quantity, is permitted to women.

The more we think of clothing, the more we realise what an important part it plays in our lives. There is plenty of evidence of this importance in the streets of any big city. A walk along Oxford Street and Regent Street,

or the principal thoroughfares of the suburbs, such as Brixton, Tooting, Hammersmith, Holloway or Kensington, or the main streets of provincial cities and towns, provides ample evidence of the tremendous importance attached to clothing.

The clothing industries have a big background both in the present and the past. Here again, we find a contrast between the old craftsmanship, which has been going on for thousands of years, and the new scientific technique of which an outstanding example is the *Artificial Silk Industry*.

TANNING

Silk weaving and spinning are as ancient as civilisation itself, and so is the tanning industry, which has always been an important branch of the leather trade. We may now observe an interesting illustration of the invisible links which exist between apparently unconnected facts. The reader may not be aware that the tanning industry had, nearly a thousand years ago, a decisive effect upon the history of England, and, therefore, upon the history of the world. It is probably not unreasonable to say that the tanning industry was responsible for the Norman Conquest.

William the Conqueror, and his Normans, unquestionably laid the foundations of what has become the British Empire. It is at least doubtful whether the original Saxons would have developed into an Imperial power without the infiltration of the dominant Norman blood. What has all this to do with tanning? The father of William the Conqueror fell in love with the daughter of a tanner, who became the mother of the Conqueror. The tan-pit in which she worked is, we believe, still to be seen in Normandy.

From very ancient times, vegetable fibres, such as cotton and flax, and animal fibres, such as wool, have

been used for the making of cloth fabrics. Here we notice the difference between the clothing industry and the building industry.

As indicated in another chapter, the building industry has been unable, in certain of its important branches, to break away entirely from the ancient craftsmanship. Thus an ancient Roman builder's foreman would very quickly adapt himself to much of the building work of to-day. On the other hand, a woman of ancient Rome, however expert with her spinning wheel, would be completely mystified by a Lancashire mill and a modern power-loom.

Water power, steam and electricity, and ingenious machines, have revolutionised the traditions of textile manufacture. We will now deal with a few examples of the improvement in textile processes introduced by Science.

TEXTILE PROCESSES

Until the end of the eighteenth century it took a whole summer to bleach a piece of cloth. Large bleaching fields were used in which cloth, after being treated with a caustic substance, was spread out on the grass. Here again, we come across the invisible links between apparently dissociated things. Chemical science discovered chlorine gas with its bleaching properties, and now bleaching is done rapidly in a factory. Not only has time been saved, but an enormous amount of space. But for this discovery it would be literally impossible to do the necessary bleaching of cloth for the present population of England. Under the old method about half the area of England would, during the summer, be covered with cloth spread out on the grass for bleaching. As it is, this is done inside the factories which occupy a small part of the area of the country.

Scientists are busy studying the various processes connected with the cotton, woollen, leather and laundering

industries. This work is being done partly under the auspices of the department of Scientific and Industrial Research, partly by Universities, and partly by private firms. Other aspects of the work are sheep-breeding for wool, rabbit-breeding for fur, and scientific research regarding the food of sheep and the quality of their wool. There are also numerous laboratories concerned with linen, silk (real and artificial), boot and shoemaking, cotton weaving, cotton growing and dyeing.

LEATHER, WOOL AND COTTON

Leather is keeping the scientist busy as efforts are being made to standardise the tannin content of the substances used for tanning. The physical and chemical conditions most favourable for tanning are also being carefully investigated.

Science has also discovered the limits of temperature and of alkalinity within which the scouring of wool must proceed if the wool is not to be damaged. The scouring of wool means freeing it from its natural grease and from dirt.

A big problem in the cotton industry is the standardisation of the lengths of the fibres in different cottons. Here the science of statistics comes into play. Mathematical statistics have been called upon to make pronouncements which have led to decisions as to the precise uses the different cottons should be put to.

Another direction in which Science is helping is in ascertaining the different types of treatment with size to which cotton fibres are subjected in order to strengthen them.

How many of us realise, when a new swim-suit shrinks so that we can hardly put it on, or splits in the most inconvenient manner, that the Wool Research Association is employing scientists to deliver us from such annoyances?

THE WOOL RESEARCH ASSOCIATION

Here we find once more our invisible links turning up. What can be the connexion between sun-bathing and the Wool Research Association? The connexion is as follows: the manufacture of diminutive, tight-fitting sun-bathing costumes has become an industry, and the scientists have discovered that shrinkage is not only due to sea water and drying, but is also due to the ultra-violet rays in sunlight, which damage the cellular structure of the wool just as they do the cellular tissue of our bodies.

The trouble with bathing-dresses arises from the fact that in the sea there are numbers of bacteria which, while they are quite harmless to the human body, become very active when warmed by the double agency of the heat of the sun and of the human body. When they get thus active, they begin to rot the wool in the bathing-dress. The Research Association have discovered an antiseptic against these bacteria. They have found out how to treat the wool and help it to resist the ultra-violet rays; and they have discovered a process for preventing shrinkage. So it is that bathers, in the sunlight and in the sea, have occasion to be grateful to the Wool Research Association.

SCIENCE AND THE MOTH

What is the connexion between the moth, of which housewives sometimes have occasion to complain, and timber research? The connexion is this: an anti-clothes-moth campaign is being carried on by the research students, and the Forest Products Research Station is testing boxes of cedar, and other Empire aromatic woods, for their capacity to keep the moths away.

VARIOUS EXPERIMENTS AND THEIR RESULTS

We all like our clothes to be comfortable. Are we aware that the comfort of clothes depends largely on the

ease with which air can penetrate the fabric? We all know that a thin sheet of material which is impermeable to the air (e.g. a rubber mackintosh) is much more uncomfortable than thicker material which is permeable. Scientific instruments have been invented to test fabrics from this point of view.

A similar problem, in a more complicated form, confronts the boot and shoe trade. Here we have to evolve a leather which will not only keep water out, but will, at the same time, let air in, and the Boot and Shoe Trade Research Association is busy experimenting.

There was once a woman who found that while she had been cooking, the front of her jumper changed colour. This started a line of research which led to greatly improved methods of preventing white flannels from turning yellow.

We have referred to the tanning industry. The older people amongst us will remember that the word "tannery" used to be associated with horrible smells. The scientists have now done away with this. The chemist has stepped in, and has discovered a preparation which not only greatly increases the cleanliness of the tanning process, but greatly decreases the objectionable smell, and, at the same time, improves the product.

We now come to an illustration of the wisdom of not under-estimating the importance of scientific research. It is only comparatively recently that creaseless cotton has appeared on the market. It took actually fourteen years of scientific research before the scientists engaged discovered a synthetic substance which, when mixed with cotton, gave the fibres the necessary elasticity. If the business people who employed these particular scientists had not been far-sighted, but had been impatient at the slowness of their progress, this great improvement would not have taken place.

ARTIFICIAL SILK

Artificial silk is a child of which Science is very proud. It began with the making of artificial fibres by dissolving cellulose and squirting it through holes under pressure. This process was actually discovered in chemical laboratories which were not concerning themselves in any way with the manufacture of silks. In the beginning, the stuff curled and crinkled, dyed badly, shrank and easily went to pieces. Persistent scientific research has produced the excellent artificial silk which is now on the market.

THE SCIENCE OF THE SOIL

A Science of the Soil has sprung into being in recent times. The Russians, stimulated by the need of developing their resources to meet the demands of the new Soviet State, have made great contributions towards the advancement of this science, and English scientists have also done great work in this direction. Owing to the fact that so many tropical areas come within the confines of the Empire, Great Britain has its own special problems to face. Owing to the great heat and the tremendous rainfall, tropical soil and tropical plants are completely different from those of the temperate regions. Consequently, such places as East Africa have their own research stations. When the Germans occupied this region before the First World War, they started a research station which has been so enlarged by the British that it now provides for the whole of the East African territory. The value of the research work now going on there to agriculture in those parts cannot be over-estimated. The work of these local stations is co-ordinated by the Bureau for Soil Science at Rothamsted in England.

ANIMAL BREEDING AND NUTRITION

Edinburgh has its Animal Breeding Research Department, Aberdeen its Animal Nutrition Department, whilst

pasture and grass land are being dealt with in Wales at Aberystwyth. The Dominions also play their part, as, for instance, the Veterinary Research Station at Ondes-terpoort in South Africa.

MECHANISM AND AGRICULTURE

In the field of *Mechanism and Agriculture*, one of the difficulties confronting those responsible for hay crops is that of rotting through damp. In order to meet this difficulty, grass-drying machines have been invented, and are now in commercial use. A fan blows hot air over the wet grass moving on a travelling belt.

The grass-drying machine is not a new thing in agriculture, but the latest models are much more effective and more easily workable than the older ones.

Since the introduction of these machines on a considerable scale, there has been a great increase in the number of hay crops which have been saved, and there is also evidence that, as a result, greater quantities of this highly nutritious natural food have become available for live stock, with very beneficial results.

FORESTRY

Science is giving great assistance to commerce and industry in the realm of *Forestry*, the Imperial centre of which is attached to Oxford University, added to which there is a Forests Products Station at Princes Risborough. It is owing to the technique evolved by the scientists engaged in forestry that the teak of Burma, the pine forests of Canada and the innumerable species of trees in the forests of India, Africa and Guiana have been made more profitably available to industry.

One of the most up-to-date countries in the world in the practice of the Science of Forestry is Sweden, where there is a close connexion between timber and the manufacture of paper. To begin with, they carefully

preserve their forests. They are fortunate in that their rivers flow steadily and quietly, and it is possible to use them for the transport of the logs.

When these reach the mills they are drawn up by a mechanical process from the river, chopped into short pieces, and thrust under tremendous pressure against grindstones, or cut into chips which are boiled up with sulphite in digesters in order to separate the fibres. Two types of pulp are thus obtained, viz. mechanical and chemical. These are mixed in huge cauldrons, and the liquid poured on to a moving wire screen through which the water is absorbed. We are reminded of a famous film, "Modern Times," where Charlie Chaplin got himself into difficulties with an apparatus of rollers about 12 feet high and 80 feet long. It is through a machine of this kind that the wood pulp passes over a complex of drying cylinders, and emerges as great rolls of paper.

Within reach of these works are the great forests whence the wood is obtained, and farther down the river on the Gulf of Bothnia are the ports from which both pulp and paper are sent forth to all parts of the world. One of the most wonderful processes is that by which slabs of this pulp some 3 inches thick are compressed into wall-boarding one-eighth inch thick, and much stronger than ordinary wood.

THE GRID

We all know what is meant by *the Grid*. Its pylons and wires are so conspicuous that they are now as familiar to us as telegraph poles. But are we clear as to what lies behind them? Do we know that there is a close connexion between the Grid and the Splitting of the Atom? In what possible way can these two things be connected?

In order to produce and distribute electrical power with the maximum amount of economy and efficiency, it has been necessary to evolve high-tension transformers and condensers. The research work which has resulted in

introducing these devices has opened out other avenues of research leading towards the disintegration of the atom.

The centralisation of the distribution of electrical power tends strongly in the direction of the reduction of production costs and the increase of output.

PLASTICS

To understand the nature of *Plastics* it is necessary to appreciate the fact that a plastic material is one which can be made under heat and pressure to assume a predetermined shape. There are hundreds of plastic materials which fall into two main classes: Thermoplastic and Thermosetting products. The former can be softened and resoftened indefinitely by applying heat and pressure; the latter on the application of heat and pressure takes a definite consistency and density which cannot be altered by further heat and pressure. The early Egyptians and the Romans were, so far as we know, the first people to use plastics. They used resinous and waxlike masses found in the natural state. These belong to the thermoplastic group. One of the earliest examples of the use of plastics is the wax seal to be found on so many historical documents. More recent is the use of shellac for phonograph and gramophone records. Next we have pitch and bitumen products of which the familiar black bottle-stopper is an outstanding example. Another well-known plastic product is celluloid. Endeavours to reduce the inflammability of this material led to the production of cellulose. Another important branch of the thermoplastic family is the group of the glass-like plastics.

In spite of the great importance of thermoplastics the plastic industry to-day is largely dependent on thermosetting products. An outstanding example of this kind of plastic product is Bakelite. This does not mean that thermoplastic products have ceased to be in demand, on the contrary the advent of the thermosetting products has stimulated the growth of the other branch of the

family. What has happened is that a vast new field of industry has been opened up by the advent of thermosetting materials.

Some of the more familiar uses of plastics are to be found in such articles as are made in imitations of tortoiseshell, ivory, amber, pearl, etc., thus bringing within the range of people of moderate means many beautiful things. With the development of thermosetting materials we find walnut and mahogany veneers appearing with consequent beautifying of the homes of people who in a past age could only see such things in the homes of princes on the rare occasions when they were permitted to see such places. Then came the development of colour-free base materials. Plastics thus became a means of expressing the widespread human desire for a colourful environment, providing as they do a light, smooth non-corrodible material, easily convertible into myriad shapes of any conceivable colour. An interesting example of the influence of plastics on shape is streamlining, of which a familiar example is the telephone instrument. Other objects in general use which owe their development to plastics are: fountain pens, toothbrushes, the matrix for false teeth, combs, the plastic pack used in beauty parlours, transparent wrapping material, fittings in hotels, railway carriages, ships and aircraft, motor-cars, radio instruments, and in war time gas masks. Plastic materials are used in the lacquers which are applied to domestic refrigeration apparatus. One of the most important uses of plastics in this and other industries is as heat-insulating material. One of the best known of these is Isoflex which is also used in the construction of greenhouses. It has also been used to replace window glass in bomb-blasted buildings.

One of the outstanding qualities of plastics is durability under adverse conditions. This has led to the widespread use of these materials in the manufacture of chemical plant, electrical plant, machine housings, fan blades,

linings for valves and pipe lines, corrosion-resisting gears, water-lubricated bearings for rolling mills, paper mills and textile factories.

METALS

The non-technical person would probably describe a metal as a hard bright substance which can be hammered into various useful shapes. Most metals are to be found in nature in combination with other substances the combination being known as a mineral or ore. Normally these are earthy-looking substances not in the least like metals. In order to convert them into metals the ores are treated by fire or chemical treatment. Primitive man learned that metals could be liquefied by heating them in furnaces, pouring them into clay or stone cavities, and allowing them to become solid and thus assume the shape of the cavity. This is what is known as casting.

It was next discovered that by blending metals with other substances they could be made harder and tougher. The resulting blend is known as an "Alloy." One of the earliest known alloys was bronze, made by mixing copper with about one part in ten of tin. When the Romans came to Britain they were using iron and bronze for weapons, tools and agricultural implements; lead for water pipes, baths and coffins; tin, gold and silver for ornaments; silver, brass and bronze for coinage.

The outer skin of the earth has been estimated to contain 17,000,000,000,000,000,000 tons of material. On analysis, which, of course, is approximate, the composition of the earth's crust has been found to be as follows:

Oxygen	.	.	.	.	46.46%
Silicon	.	.	.	.	27.61%
Aluminium	.	.	.	.	8.07%
Iron	.	.	.	.	5.06%
Calcium	.	.	.	.	3.64%
Potassium	.	.	.	.	2.58%

Magnesium	.	.	.	2.07%
Titanium	.	.	.	0.62%
Hydrogen	.	.	.	0.14%
Phosphorus	.	.	.	0.12%
Carbon	.	.	.	0.09%
Manganese	.	.	.	0.09%
Sulphur	.	.	.	0.06%

Some ores are more easily smelted into metal than others. Iron is one of those which can be easily smelted. This can be done on a big scale in blast furnaces, and the expenditure of time, labour and fuel is comparatively light. Aluminium ore on the other hand requires a heavy expenditure of electrical power to separate it from the oxygen with which it is combined in the ore. It is an interesting fact that ordinary garden clay contains 25% of aluminium combined with silicon, oxygen, iron, calcium and magnesium. One hundred barrow loads of clay could produce enough aluminium to build a fighter aircraft, but the process of extraction is too expensive.

Metallic ores are to be found in considerable quantities in Rhodesia, Mexico and parts of the U.S.A.; Arabia and Palestine on the other hand are poorly endowed with these materials although it is thought that the Dead sea is a potential source of metals, particularly of magnesium. The Ural mountains are a vast source of iron ore and the U.S.S.R. has built the great iron-making city of Magnitogorsk in that region. Britain is not rich in metallic ores with the exception of iron. Cornwall contains every variety of known ore.

The following list contains a few of the more prominent metals and alloys with typical examples of the uses to which they are put :

Aluminium	.	.	.	Frying-pans and culinary equipment generally.
Aluminium (alloyed with magnesium)				Tubes and sheet for aircraft

Duralumin	Aircraft.
Magnesium Alloy with 8% aluminium	Aircraft landing wheels.
Copper	Tubes, copper wire.
Ditto with brass	Cartridges.
Ditto with copper-nickel alloy	Condenser tubes.
Wrought Iron	Chains.
Mild Steel	Ships' plates.
Nickel-Chromium Steel	Camshafts, gears.
Cast Iron	Lathe beds.

In the Second World War the distribution of metals between the Allies on the one hand and the enemy on the other was roughly as follows and this distribution had a material effect on the course of the war :

Iron	Distribution even.
Copper	Advantage with the Allies, to an overwhelming extent.
Aluminium	Ditto
Zinc	Allies better off.
Magnesium	Balance on the whole favourable to the Allies.
Tin	Balance very favourable to Japan.
Nickel	Enemy "also ran."
Mercury	Enemy "nil."
Magnesium } Chromium } Vanadium } Molybdenum }	Enemy "also ran."
Lead	Allies had the "lion's share."
Tungsten	Equally divided between the opponents.

Distribution of metallic ores in the territories of the three leading nations of the world :

THE BRITISH COMMONWEALTH AND COLONIAL EMPIRE :
Iron, manganese, vanadium, chromium, tungsten,
magnesium, copper, gold, lead, zinc.

U.S.A. : Iron, tungsten, nickel, aluminium, gold, lead,
magnesium, mercury, silver, zinc.

U.S.S.R. : Iron, manganese, gold, copper, nickel,
platinum.

The above lists are merely illustrative, and must not be taken as in any sense exhaustive.

CREEP

The National Physical Laboratory is conducting some experiments in testing what is known as "creep" in a metal such as *Steel*. What do we mean by this word? Metals such as steel and lead are subject to a very slow distortion from whatever forces may be acting upon them. Lead is a soft metal and the creep is usually considerable. For instance, where roofs are made of lead, the metal frequently tends actually to move downwards, causing the upper part of the roof to grow thin and the lower part to thicken, and grow out into waves.

Even very hard steel incurs a certain amount of creep. When you are using this metal for machinery, especially of a delicate type, the creep becomes a matter of very great importance. Delicate devices have been manufactured for the purpose of detecting this creep. Until recently it had been possible to detect a movement of not more than one-millionth of a given length of metal per day. In view, however, of the fact that high-speed turbines and other new machines place a tremendous strain upon the metals of which they are manufactured, it has been necessary to devise much more accurate tests. As a result of experiments, it has now been possible to detect a movement of one hundredth-million per day. An example of the result of these experiments is the fact that it is now possible to allow for a variation of one twenty-thousandth part of an inch per annum in a piece of steel of a length of 1 foot.

CHAPTER X

SCIENTIFIC RESEARCH AND HUMAN LIFE

*The Atomic Bomb—Imperial Institute of Entomology—
Insect Pests—Malaria—Beetles—Citrus Fruit Saved—
Parasite Zoo—Tsetse Fly and Locust—Kew Gardens—
Constructive Work at Kew—Anthropology—International
Co-operation—Acoustics—Refrigeration—Electro-plating
—The World Wars—Gas—Armour Plate—Roadless
Transport—Medical Psychology—Gas Research—The
Work of the Libraries.*

THE ATOMIC BOMB

FEW people among the hundreds of millions inhabiting the English-speaking world can be unaware of the circumstances which accompanied the first appearance of the Atomic Bomb. The Japanese city of Hiroshima was destroyed one summer day in 1945 by the explosion of a small bomb at an altitude of 1,500 feet. This bomb had been launched by an American war-plane from a great altitude. The casualties were 200,000 including 60,000 dead. Shortly after another bomb was dropped on another Japanese city, Nagasaki. The portion of the city where the bomb was dropped was destroyed. The remainder of the town was only saved by the fact that it was protected by hills. Soon after the Japanese Government, realising that the new weapon rendered further resistance useless, surrendered.

The Governments of Great Britain and the U.S.A. announced that the new bomb was the result of joint research, conducted on behalf of their Governments by scientists of both nations, into the possibility of releasing and utilising atomic energy. Those researches had been successful and the new bomb was the result, and con-

stituted an instance of the controlled releasing of that energy. The whole civilised world at once grasped the possibilities inherent in that discovery. It was realised that these were both creative and destructive. Properly used atomic energy could confer great material benefits on the human race. Improperly used it might destroy civilisation. The political and economic problems of the next hundred years will centre upon the use of atomic energy. It is clear that the world to-day can no more turn its back upon this discovery than could the world of the year 1800 ignore the potentialities of steam.

What then is this atomic energy? It is the energy locked up in the atom. The atomic theory was put forward by John Dalton at the commencement of the 19th century. According to this theory all matter is made up of minute particles known as molecules. These molecules are so minute that they cannot be revealed by the most powerful microscope. Lord Kelvin told us that if a drop of water could be increased in size so as to occupy the same cubic space as the earth itself, its molecules would vary in size between a small shot and a cricket ball. The molecules themselves have an internal structure, their constituent parts being known as atoms. The different kinds of matter with which we are familiar in everyday life each have their own peculiar molecular structure. Thus liquids, metals, minerals, vegetable matter and gases differ from each other because of the difference in the internal structure of their molecules. A molecule of water, for instance, is made up of two atoms of hydrogen and one atom of oxygen. On the other hand a molecule of hydrogen contains two atoms. A molecule of chalk (known to chemistry as calcium carbonate) contains one atom of calcium, one atom of carbon and three atoms of oxygen.

Just as the molecule has its own peculiar internal structure, so has the atom. It is this difference in the internal structure of different atoms which accounts for

the difference between elementary substances such as iron, carbon, lead, mercury and oxygen. The atom of iron has a different internal structure from the atom of carbon and from the atom of lead, mercury and all other substances ; and so with carbon, lead and all other elements the internal structure of their atoms is peculiar to them. It is the internal structure of its atoms which makes iron different from any other substance, and so it is with lead, mercury and all the other elements.

What is this internal structure? In answer to this question we cannot do better than quote the greatest modern authority on Physics : Sir Arthur Eddington. In his book "The Nature of the Physical World" he says :

"Let us take the simplest of all atoms, the Hydrogen atom. This consists of a Proton and an Electron, that is to say a unit charge of positive electricity and a unit charge of negative electricity. The Proton carries nearly all the mass of the atom and remains rocklike at the centre, whilst the nimble Electron moves round in a circular or elliptical orbit . . ." The atom is therefore like a sun with a planet revolving around it.

The atoms of the different elements differ as regards weight and internal composition. That is to say that an atom of iron differs from an atom of hydrogen both as regards its weight and the number and behaviour of its electrons. The lightest of all known atoms is that of hydrogen. Its weight is therefore used as the standard, and when we speak of the atomic weight of iron as 56 we mean that the atom of that element weighs 56 times as much as an atom of hydrogen.

The discovery of the structure of the atom is the culmination of a process of research which began with the discovery of gunpowder.

The first explosive was gunpowder, and the first artificial explosion was brought about by Roger Bacon in his primitive laboratory in a monk's cell in a monastery

of the Middle Ages. By his experiment he opened new ways of releasing and storing energy. It is no exaggeration to say he set in motion a series of events which culminated in the atomic bomb.

An explosion is a release of energy, simultaneous with the formation of a large volume of gas. When gunpowder explodes it produces gases whose volume is about 500 times that of the gunpowder used. At the same time heat is generated (or more strictly liberated) by the explosion, and this heat causes the gases to expand at once to a volume about 4,000 times that of the gunpowder. It is the sudden expansion of these gases which constitute the "Blast" of the explosion.

Nitro-glycerine is a modern high-power explosive much used in warfare. Its molecule contains 3 atoms of carbon, 5 of hydrogen, 9 of oxygen and 3 of nitrogen. It produces, on exploding, 1,200 times its own volume of gases, expanding under heat to 10,000. Why does nitro-glycerine explode with such terrific force? The answer is *Molecular Disintegration*. That is to say, by *splitting the molecule* of nitro-glycerine, a terrific amount of heat energy is released, which was stored inside the molecule.

Until the discovery of radio-activity there were no instances of disintegration of the atom. The forces holding the atom together were so immense that no artificial means could be invented to overcome them, disintegrate the atom and release the tremendous energies locked up within its periphery. Then came the discovery of radium and radio-activity, which is a manifestation of spontaneous disintegration of radium atoms. During the researches which followed it became clear that, if *atomic disintegration* could be brought about, and controlled just as had been done with molecular disintegration, a new source of energy of unparalleled magnitude and efficiency would become available to mankind. This atomic disintegration has now been accomplished and sufficiently controlled to enable the atomic bomb to be produced. The

problem before the scientists now is so to control the process of disintegration, that energy thus released can be utilised for production instead of destruction. There is no doubt that they will accomplish this.

A far more difficult problem is the prevention of the misuse of this new source of energy. The only answer appears to be effective International Law, backed by *Enlightened Democracy*, based upon the fundamental Christian ethic embodied in the *Sermon on the Mount*. This is the task, in the accomplishment of which all people of goodwill of all nations must unite.

IMPERIAL INSTITUTE OF ENTOMOLOGY

Among the worst enemies of the agriculturist are the insects, fungi and other living things that prey on trees and crops.

The Imperial Institute of Entomology working in close association with the Natural History Museum at South Kensington, and the Institute of Mycology co-operating with the Royal Botanical Gardens at Kew, may be regarded as a kind of G.H.Q. of the war on these pests which is being carried out all over the world.

What do we mean by *Entomology*? We mean the study of man's second worst enemy: the Insect. His worst enemy is, undoubtedly at times, himself.

And what do we mean by *Mycology*? This is the study of mould, rust and other fungi.

INSECT PESTS

All over the world men are busy naming, describing and classifying insects. The magnitude of this task will be realised when we face the fact that we already know of 500,000 different kinds of insects. We often hear people gibing at the Entomologist as though he were a useless kind of crank. If we only knew, there is no

worker in the world whose work is more vital to our comfort and our safety.

MALARIA

We are all familiar with malaria, either by personal experience or by repute, and most of us know that the malaria germ is carried by mosquitoes. This knowledge by itself helps very little, because some mosquitoes carry malaria and others do not. Furthermore, each kind of malaria-carrying mosquito breeds in certain types of surroundings, and not in others. The first step, therefore, towards tackling this pest is to observe and classify the different types of mosquito.

BEETLES

Some types of beetle are destructive to crops, whilst others, closely related to them and very similar, are harmless.

Now, one of the great methods by which these pests are tackled is the introduction of other insects, which prey upon them but are, none the less, harmless to the crops which are being damaged. This is what is known as *Biological control*. Here again, you can do nothing effective until you have classified the different types of beetle, and the different types of parasite which prey upon them.

CITRUS FRUIT SAVED

In connexion with Mycology, we find an illustration of the value of biological control.

The citrus-fruit plantations of Western Australia were attacked by a virulent fungus pest. A similar pest had been doing a lot of damage in Florida. So the same steps were taken in Western Australia as had been taken in Florida, but the fungus carried on without taking the slightest notice of the parasite which had been introduced

from Florida with a view to destroying it. So the students at the Imperial Institute of Mycology were called in, and their investigations revealed that the fungi in Western Australia, although outwardly similar to those that were operating in Florida, had totally different life-histories, and had to be tackled with a different parasite.

PARASITE ZOO

At Farnham Royal is to be found the field laboratory of the Institute of Entomology, which has been nicknamed the *Parasite Zoo*, because its job is to send out battalions of parasites to different parts of the Empire according to their needs.

These parasites are insects which lay their eggs in the grubs or the eggs of the pests, and destroy them. Some time ago, a small moth found its way into the Fiji Islands. It bred rapidly, and was busily destroying the coco-nut crops, when the Entomologists took the field. These gentlemen had a look at Malaya, where they found the necessary parasite which they proceeded to breed in Fiji, and soon the day of the little moth was over, and the coco-nut crop was saved. Another destructive creature is the sword-fly, which attacks Canadian wheat. No doubt the Entomologists will, in due course, find the antidote to this little pest, which did over £2 millions worth of damage in the province of Manitoba in one year.

TSETSE FLY AND LOCUST

Another insect pest is the tsetse fly, which does terrible damage among African cattle, and African men as well. The research station at Tanganyika has been experimenting to exterminate this scourge, and great results are expected.

Another destructive pest is the locust. Great work has been done in this field by the Russian scientist, Uvarov,

under the auspices of the Imperial Institute of Entomology. Reports come in from all over Africa as to the movements of the locust, and maps are prepared to discover their homes, in order to destroy them in their breeding-places. It has also been discovered that finely powdered sodium arsenate will kill them, and it is hoped that much may be accomplished by airmen flying over swarms of migrating locusts, and discharging clouds of this substance right into the swarms and destroying them.

KEW GARDENS

Most people look upon *Kew Gardens* as a pleasure resort, but Kew is far more than this. It is the Botanical Research centre of the Empire. In the Herbarium there is to be found a huge collection of plant specimens from all over the world. Here the staff is busy naming and classifying these plants. This work of classification has very great commercial value. Take, for example, camphor. There are two varieties of the camphor plant. From one of these camphor oil can be obtained, but from the other solid camphor is extracted, which has much greater commercial value. It is quite impossible to distinguish between these two plants by mere superficial examination. The two varieties can only be identified by the expert botanist.

There is a certain beautiful yellow wildflower known as St. John's Wort. This little plant was accidentally introduced into Australia, where it spread rapidly, and proved exceedingly destructive to some of the most important native plants. The local people took it for granted that it was the ordinary British St. John's Wort, and a certain type of insect, which is known to be destructive to this flower, was introduced into Australia. The result was negative, and the plant continued to flourish. So the Botanists at Kew were called in, and discovered that it was not the English variety, but the

Continental one which is very similar but has to be attacked with a different type of insect.

CONSTRUCTIVE WORK AT KEW

Much constructive work can also be placed to the credit of the Botanist. To Kew belongs the credit of introducing into India the Cinchona tree, which is indigenous to Peru. This tree has a bark from which quinine is made. India was thus helped in the campaign against malaria.

To Kew, again, is due the distribution of the rubber plant, first grown in Brazil, but now to be found in many parts of the Empire. There is a plant in China known as the Tung-oil plant. From this excellent paint and varnish are obtained. The Botanists have spread it all over the semi-tropical regions. Again, there is the Chalmogra plant, the oil from which is the best-known specific against leprosy. Its home is in Asia. It has been introduced into Africa and the West Indies, where the need of it is deeply felt. Often these plants have to be propagated in the greenhouses of Kew before they are introduced into their new homes.

ANTHROPOLOGY

It would probably surprise many people to know that it would be difficult, if not impossible, efficiently to govern large areas of the Empire without the help of the *Science of Anthropology*. What, then, is this science? It is the study of human customs and beliefs, and modes of social life. In the outlying regions of the Empire, such as Africa, it is possible for mistakes in administration to be made with serious results through lack of understanding of the ways of thinking, feeling and living of the people to be governed.

For instance, if a white man takes over the administration of one of these regions without any training or knowledge other than those he derives from his European life,

he is liable to go seriously wrong. In his own country, for instance, every trace of feudalism has vanished. The right of ownership is vested in every citizen, and feudal privilege is unknown. The white man may proceed, and indeed on occasions has proceeded, to substitute European notions of property for those current in the tribe, regardless of the fact that individual rights are hardly recognised. Land, for instance, is never owned by an individual in a typical African tribe. It is owned by a clan or family group, and this clan or group is regarded, not merely as something existing in the present, but as existing in the past and the future as well.

If our white man had been trained in anthropology before he took over the administration he would have approached his problems from a totally different angle, and would have avoided seriously antagonising the tribe and creating chaos. The danger of attempting to brush aside immemorial customs and ways of thinking has been illustrated again and again by the behaviour of natives when they live in contact with the white man's system of life. We are all familiar with the grave deterioration which sets in under these circumstances.

There is clearly much room for a careful scientific investigation here. In fact, a new field of anthropological investigation has opened up, namely, the results of the mixing of cultures, and the endeavour to find some means of controlling the effects. Work is already being done in this direction at the London School of Economics and the International Institute of African Languages and Cultures.

INTERNATIONAL CO-OPERATION

At this point the possibility of international co-operation begins to emerge. France, and in a minor degree Italy, have African territories, and scientists in those countries are beginning to co-operate with those of Great Britain.

ACOUSTICS

An important work which is carried on behind the scenes unknown to the public excepting through its results is the research being done in *Acoustics*. Here again we seldom stop to think. We certainly ought to do so. If we only realised how much we owe to these research-workers of whom we seldom hear or think, we should be better citizens, and should insist upon our Governments giving more support to this branch of scientific research. It is well known that until recently halls designed for music and speech-making were often extremely defective in regard to their acoustic properties. The Science of Acoustics has altered all this, and such halls are now built with careful regard to the laws of that science. In recent times, it has been necessary to take into account also, in this type of construction, the use of loud speakers and microphones.

The science of acoustics is also being applied to the noisiness of the streets in modern times, and to the disadvantage in the matter of noise which attaches to the vast modern blocks of residential flats.

During the War, research workers in acoustics made discoveries of vital importance, which made it possible to listen under the water for the sounds made by submarines, and on land to detect the positions of aeroplanes and guns.

REFRIGERATION

Refrigeration is familiar to everyone to-day. How many of us know that this contrivance is due to a discovery by the great Faraday? He found that, under the influence of cold and pressure, it was possible to condense certain gases into liquids. It is upon this discovery that the vast modern industry of refrigeration rests. It is upon this industry that we depend for preventing our food supplies from going bad. By its help we have learnt how to bring food cheaply and safely from abroad; and since Great

Britain is unable to produce food in sufficient quantities at home, the importance to her of the refrigeration industry is incalculable. It should be observed, however, that one effect of the foreign supplies has been to keep home prices down to a level which makes it difficult for our own producers to make a living. This is another indication of the close interweaving of everything in the modern world.

ELECTRO-PLATING

Another discovery which we owe to Faraday is the process known as *Electro-plating*. Anyone visiting the Museum of the Royal Institution, in Albemarle Street, would see, among things illustrating the work of Faraday, an iron ring wound with copper wire. This was the foundation of the colossal industry of electrical engineering.

THE WORLD WARS

Have the *World Wars* stimulated *Scientific Progress*? Clearly the wars have given a great impetus to scientific research in certain directions, and although the immediate object has been the improved efficiency of the instruments of war, the effect has undoubtedly been the acquisition of much additional scientific knowledge of value quite apart from that useful in war.

The answer is : "Yes." The discovery of the means of harnessing the colossal energy locked in the atom and embodied in the famous atomic bomb is the result of scientific research conducted during the war, and stimulated by every means in their power by the Governments of the United States, Great Britain and Germany. Great improvements have been effected in the production of synthetic rubber under the influence of the shortage of natural rubber caused by the Japanese occupation of Malaya. The modifications and improvements of the aeroplane engine during the 6 years of war have been tremendous. In the realm of wireless, improvements

which might have taken 50 years to develop in peace-time have been achieved in 6 years, and the same may be said of chemistry, bacteriology and mechanical engineering.

GAS

We have elsewhere referred to the use of *Gas*.

Of late years gases more deadly and effective than those used in the Great War have been discovered. New methods of projecting gas have also been invented which will make it possible to flood great areas rapidly, and with a density of gas never approached during the Great War. It must also be remembered that the great modern industrial nations have the plant for manufacturing this poison gas on an immense scale. As against this, scientific research is leading to successful protective devices against gas being adopted on a large scale.

ARMOUR PLATE

Conversely there was, and is, a constant endeavour to improve the strength of armour plate and the resistance in big guns to the terrific pressures to which they are subjected, and an endeavour to secure greater accuracy in turbines. These researches have produced new heavy alloys and improved accuracy in steel manufacture. The benefits conferred upon peaceful industrial activities are numerous.

Similarly the endeavour to make war-planes lighter has stimulated research in the direction of producing light and strong metallic alloys.

ROADLESS TRANSPORT

Another direction in which war-stimulated scientific researches have produced beneficial results in the realm of peace has been in the development of roadless transport. The tank has led to the caterpillar-tractor which, in turn, has made possible the conversion of barren moorlands into good grazing land, and, no doubt, many other

developments in the future, such as the crossing of hitherto uncharted regions of the continents of Africa and Asia.

MEDICAL PSYCHOLOGY

Shell-shock, first experienced on a large scale in the First World War, was the cause of unprecedented progress in one of the most important fields of medicine, viz. *Medical Psychology*. The War gave rise to a crop of war-neuroses which were grouped together under the title of shell-shock. Before the War the treatment of neurotics was very backward. The researches, stimulated by the extraordinary variety of pathological nervous states with which the medical profession was confronted after the War, have led to a profound modification of outlook upon the problems of crime, of family life, of sex and of education.

GAS RESEARCH

Gas masks are associated in our minds with war and air-raids, but this is far from being the only way in which these devices have affected human life. As a matter of fact the researches which have been carried out with a view to perfecting the gas mask have brought in their train a number of important industrial improvements. Why is this?

The answer is *Charcoal*. This substance is used in gas masks to absorb poisonous matter out of the air. In order to accomplish this purpose charcoal must be porous and chemically clean. It was, therefore, necessary to investigate methods for making charcoal porous and clean. These studies have led to improvements in methods of dealing with gas mixtures, such as separating one gas from another, and purifying commercial gas, etc.

Another indirect result of these researches concerns the bad effect on industrial workers of inhaling dust. For instance, stone workers are apt to inhale stone dust, which is bad for them. Certain kinds of stone dust are

used to prevent explosions in coal mines, and are bad for miners. The researchers into the question of poisonous gases were able to help a great deal in this matter of dust absorption, and owing to their efforts considerable progress has been made in dealing with this evil.

THE WORK OF THE LIBRARIES

The importance of the great scientific libraries throughout the world in assisting scientific research cannot be over-estimated. Such libraries as, for example, the Science Museum Library at South Kensington, and the other libraries of scientific research attached to universities and museums throughout the civilised world, are indispensable to the scientific research student. Their support and maintenance should be regarded by every civilised community as a matter of vital importance.

The public library is one of the chief instruments of democracy. It can be used for undemocratic purposes as was the case in Nazi Germany where the public library was used for propaganda purposes. The library should be an unbiased source of information on all branches of knowledge. It should provide that mental and moral nourishment which builds up the enlightened citizen, the cornerstone of the enlightened democratic state. How nearly that ideal is attained in different countries and localities depends on many different factors. In Great Britain, the Dominions and the United States of America public libraries are to be found in most important towns. The extent to which they satisfy or approach the ideal depends upon the attitude of the legislature, the local municipality, the quality of the librarian and his assistants, the social and economic nature of the district and in particular instances upon enlightened philanthropy.

Such internal details as the classification of the books on the shelves, the compilation of a catalogue on scientific

lines which render the books easily accessible to any intelligent person, the employment of educated and personally suitable library assistants who should be able to act as guide, philosopher and friend to the members of the public who are using the library, are of the greatest importance. The writer, before the Second World War, knew of a library in the south of England which evinced most of these characteristics. The reading room was spacious, dignified, comfortable, well lighted, "with storied windows richly dight, casting a dim religious light." At tables ranged along the side were seated young library assistants who were cheerfully courteous, and spared no trouble to help the reader to find what he wanted, whether he were a research student or an unsophisticated seeker after knowledge. The chief librarian himself was a man of strong personality, cultured and a good mixer, who took an important part in the cultural life of the town as a member of the literary society, the natural history society, the archæological society and the botanical society. He organised lectures on many subjects at the library which anyone who wished could use as the next best thing to a university.

But all this was only possible because the borough in which this library was situated was endowed to an exceptional degree with the right civic spirit and was not afraid to spend money on its public library. And this, mark you, had nothing to do with politics, as the various parties were fairly equally divided on the borough council. This municipality is, alas, a shining light among many flickering candles. If the Council of the United Nations can establish similar shining lights in the civic centres throughout the world, it will have created a potent instrument in establishing peace and countering the manifold dangers associated with the atomic bomb.

The attitude of the governing body of a country towards public libraries can assist or retard their development. Some years after the First World War the Government of

the day set up a committee to "axe" public expenditure. This committee showed particular malice towards any public expenditure of a cultural character, and the public libraries suffered accordingly. On the other hand the Public Library Act of 1919 embodies principles designed to encourage public libraries. It recognises the public library as a national institution. It removed rate and tax limitation. It removed limitations on regional co-operation. Lastly it contained the important provision that "Where the Public Libraries Acts are adopted all matters relating to the exercise by the authority of their powers except the power of raising a rate or borrowing money shall stand referred to the Education Committee."

It is interesting at this stage to contrast British with American law. It is a curious fact that although British library legislation is far more helpful to public libraries than American, there is strong evidence that the American people as a whole have shown a more general appreciation of the value of public libraries than the British. There is no national legislation governing public libraries in America. The individual states make provision for the establishment of libraries. One result is a great variation in the financial provision made for libraries in different parts of the country. In some states there is no provision for action by the people, matters being left to boards of supervisors of various descriptions. In others a petition by the people is required. In many cases the laws are unnecessarily loaded up with details regarding the preparation of catalogues, the labelling and stamping of books, the amount of fines and a mass of detail which should be left to the discretion of the librarian. All this would be avoided and many difficulties ironed out if the general principles of library law-making were laid down by the Federal Government.

In spite of all this, it is, none the less, a fact that America spends far more on public libraries than Great Britain, proportionately to the population. It has been estimated

in a survey of libraries that the average American town spends about five times as much on books and libraries as British towns of similar size. Similarly, when you compare the percentage of the population using libraries in the United States and Great Britain, and the number of volumes circulated, it is found that the American percentage is much greater.

In Great Britain an attempt has been made to combine local autonomy with co-ordination by the central government. The machinery, both central and municipal, exists. There is no legal or administrative obstacle to the full development of public libraries. The real danger of over-centralisation lies in the possibility that the central government might use the libraries for political purposes as was done in Germany. The danger is averted by the existing library law in Great Britain. It will be interesting to notice how the question is dealt with in Russia where the Government is much more highly centralised than in Great Britain.

The observant reader will naturally ask how the practice of National Socialism in Nazi Germany compared with the practice in the Soviet Union. When considering the position of libraries in Russia we are immediately struck by the difference in attitude between the Nazis and the Russians. The Nazis feared the dissemination of knowledge and hated intellectualism. On the other hand the Russians of all classes are enthusiastic in the pursuit of knowledge. The central government gives every encouragement to this pursuit. In no country in the world are public libraries so generously supported. It is the view of the central government, and of the local soviets, that the citizen must be educated. The library is considered to be as important as the school. In 1936 the Soviet Union possessed the largest library system in the world with 300,000,000 books and 70,000 libraries. To quote Mr. Cashmore's "Survey of Libraries," "Every school, park, institution, university, trade union, club,

factory, government department, railway, seems to have its own library." All this does not alter the fact that there must always be a danger of undesirable interference where too much power over the libraries is vested in the central government.

It is hoped that enough has been said to show the value of what has been accomplished, and to make it clear that it is the duty of every enlightened Government and municipality to encourage the development of public libraries and the science and profession of librarianship.

CHAPTER XI

HEALTH

*Anæsthetics—Insulin—Hæmoglobin—Pituitary Gland—
Fresh Air—Bacteriology and Hygiene—Psychological
Factors—Medical Progress—Ultra-violet Radiation—
Sun-bathing—Vitamins.*

NOWHERE has the influence of Science been greater in the last hundred years than in the sphere of Health. Its action has been literally revolutionary. Let us consider some of the things it has done.

ANÆSTHETICS

When it was necessary to perform an operation there were, prior to the nineteenth century, no Anæsthetics. It can be left to the imagination to decide what this meant in pain and suffering. A later development has been the local anæsthetic, which has done much to diminish the pain attached to dentistry. A discovery which occurred about the same time as the discovery of the anæsthetic was Pasteur's antiseptic treatment. This has rendered possible operations which could never have been attempted but for Pasteur's ideas and Lister's application of them.

There was a time when bleeding was the universal remedy for all ills. Later, the bottle of medicine used to be all the doctor had to offer his patients.

INSULIN

Modern methods of the treatment of disease are legion, and we will confine ourselves to mentioning a few of

them, such as, treatment with ultra-violet rays, injections, scientific dieting, scientific exercises, ductless gland extracts, vitamins, etc. One of the most spectacular achievements of modern medical science is the discovery of Insulin. This is used for the treatment of diabetes. Its discovery in Canada was due to long and patient researches by Physiologists, who had discovered that diabetes arose from a condition of the pancreas. It was found that the disease arose from a deficiency of the substance produced by that gland. Experiments were then made to find out whether the deficiencies in this substance could be made up from the same substance found in similar glands in animals, and this led to the discovery of insulin.

HÆMOGLOBIN

Certain serious diseases are due to a deficiency in the blood of what is known as "Hæmoglobin." This is the stuff which gives the blood its red colour, and also enables it to carry oxygen. An apparatus has been invented which can measure the amount of hæmoglobin. This led to the first important step in tackling diseases of this nature ; two of the best known are diabetes and anæmia.

PITUITARY GLAND

A vital part in the promotion of health is played by the Pituitary Gland, an organ, like a small nut, attached to the base of the brain. Now the ductless glands play an important part in the health of the body and the brain. Most of these glands have special functions, but the pituitary is a kind of super-gland. It controls growth, takes an important part in childbirth, regulates the amount of water in the body, stimulates the thyroid gland, regulates the storage and use of foodstuffs in the body, regulates sex development and even controls the

duration of life in the individual (barring accidents and disease). It is even believed that the pituitary gland has an important influence on temperament and personality.

You may well ask, what has this to do with our health?

The answer is that, since we know that all these different functions depend upon the proper functioning of this gland, and upon its discharging into the blood its own peculiar substance, we are better able to know how to treat any under-functioning of the different organs which it controls. This under-functioning is ill-health.

FRESH AIR

It is a generally accepted axiom now that we cannot have too much Fresh Air. A good many people accept this without questioning themselves as to why they accept it. If they did look into the matter they would find that there is strong scientific justification for the advocacy of fresh air, but they might perhaps be more judicious in their application of the idea.

Until a little more than half a century ago, when John Tyndall made up his mind that the air contained in large quantities what are known as bacteria, the importance of fresh air to health was not fully appreciated. The simple experiment which Tyndall used is illuminating. Tyndall filled a number of flasks with broths and extracts of different types of meat and game. His purpose was to show that these broths would remain pure for an indefinite period if they were sealed up and kept from contact with the air. He also wished to demonstrate that they would still remain pure if the air with which they were in contact retained its purity. Many of Tyndall's flasks have been kept for over half a century and are still quite fresh. When this fact is compared with the rapid deterioration of these liquids when exposed to the air, the conclusion that the air itself contains foreign bodies which cause that deterioration is inevitable.

BACTERIOLOGY AND HYGIENE

From these very simple beginnings have sprung the great modern sciences of Bacteriology and Hygiene. It is probably not too romantic an idea to regard the Public Health Department of the Ministry of Health, with its vast ramifications, as the grandchild of Tyndall's simple experiment.

From the same small beginnings the great modern building industry, with its contrivances for securing the maximum of fresh air and sunshine for worker and resident, may be said to have derived its inspiration. Here again Tyndall was a pioneer. He was very fond of walking in the country around Hindhead, and decided that the air on these uplands was purer than that of the cities and the valleys. He made his home at Haslemere, and his example was followed by others.

Everyone should know something about *Bacteria*. We are surrounded by a world visible only through the microscope. To understand it is of vital importance to the national health, to the food supply and to Agriculture. The science of Bacteriology, which investigates this invisible world, has discovered that some of its inhabitants (bacteria) are our allies, whilst other bacteria are our foes. This knowledge has prevented the spread of deadly epidemics. The recurrent plagues of the Middle Ages are now unknown in Europe. The general health of the community, and the average duration of life, have greatly improved during the last half-century. This fact is due to the sciences of Bacteriology and Hygiene.

It is frequently said that the new doctors differ from the old in that the family physician of fifty years ago was really more important for his mental and moral effect on the patient than for the medicines that he administered.

PSYCHOLOGICAL FACTORS

Some of the highest medical authorities of to-day hold that this mental and moral effect is still just as important

as "dosing"—if not more important. The majority of people still look upon a disease as something so definite as to be almost tangible. It is as though they regarded a person who is ill as possessed by some kind of evil spirit, as did the people in the Middle Ages. But the tendency of modern medical science is to emphasise, more and more, mental or psychological factors in ill-health. There are, of course, a number of diseases which involve organic degeneration, or some form of ill-health in a particular organ. These must, of course, be dealt with by the direct methods of medicine and surgery, but even these diseases are often induced in the first instance by psychological states. These states of mind may frequently be either caused by or responsible for unhealthy conditions of the glands. We have referred elsewhere to the great influence of the latter upon mental and physical health.

MEDICAL PROGRESS

Can it be said that doctors to-day are in a position to do more for their patients than were their predecessors fifty years ago? Undoubtedly they are. Many important discoveries have been made, which have helped in the treatment of disease, and the raising of the general standard of health and the consequent prolongation of life. Fifty years ago, doctors knew little or nothing about the functions of the glands, and, of course, such substances as insulin were unthought of.

It is, indeed, only recently that we have begun to find out anything valuable about the minute anatomy and physiology of the human body. We now know that our body is made up of millions of living cells, each of which is exceedingly complex, and has an elaborate internal mechanism and structure. Endocrine glands, hormones and vitamins were unknown until a short time ago, as were the curative properties of violet-rays and radium.

One important difference in outlook between the

present and past medical science is the emphasis increasingly laid to-day upon the value of nutrition and surroundings in producing healthy lives. Whilst curative medicine still holds, and will continue to hold for a long time, an important and honourable place in the national life, the whole tendency of the medical profession in its higher walks is to investigate the causes of ill-health with a view to eliminating them.

The functions of the medical profession may accordingly be defined as follows: to investigate the conditions conducive to a healthy life, and to do everything which medical science renders possible to mitigate and cure those diseases which persist, and will continue to persist, so long as there are serious defects in the hygiene, both mental and physical, of people's lives.

ULTRA-VIOLET RADIATION

For some considerable time the medical profession have been using *Ultra-violet Radiation* on a large scale in curative and preventive medicine.

It is now generally recognised that sunlight is essential to health, and one of the problems which have to be faced to-day, arising out of the industrial system and the growth of great towns, is the fact that both night-workers and town dwellers lose the benefit of the actinic or ultra-violet rays which exist in sunlight.

One type of ray which comes from sunshine is the heat-ray. It is non-luminous and penetrating.

Another type is the light-ray, which also can pass through certain solid materials, such as glass, water or thin paper. A third type is the ultra-violet or actinic ray already referred to. This ray does not penetrate far, and is the ray which produces sunburn.

Owing to the poor penetrating power of the violet-ray, it has much difficulty in piercing the dust-laden atmosphere of towns, hence the pallor of the town dweller, compared with the ruddier complexion of the country

dweller. Great development has taken place of late in bringing the ultra-violet ray to the town dweller by artificial means. The possibility of using arc-lamps for this purpose was first discovered by Finsen. It is now possible to administer ultra-violet rays in any desired intensity by this means. The medical profession makes frequent use of these rays. The mercury-vapour lamp and the carbon-arc lamp are the types most generally used.

It is a frequent practice among big firms to-day to have an ultra-violet lamp room for the benefit of the staff, and they have found that this has a revitalising effect, accelerates the cure of people who are incapacitated by illness, and reduces absenteeism from these causes. It has been found invaluable in curing industrial illnesses such as platers' rash and other dermatoses. The ultra-violet rays are very effective with septic wounds, and it has been found that treatment by ultra-violet radiation lessens susceptibility to influenza, and rapidly cures post-influenza debility.

The following statistics seem clearly to establish the value of the ultra-violet light. It has been found that in an office staff numbering 1,444, where ultra-violet light is available, the average number of days sick leave per person was 4.70. In another office staff, consisting of 2,256 where ultra-violet light was not available, the figure was 9.15. This, of course, is only an isolated example, but the value of ultra-violet rays may be regarded as definitely established.

SUN-BATHING

To understand Sun-bathing, and what it can do for us, and how it can harm us if we are not careful, it is necessary first of all to consider the nature of our skin. This is divided into three layers, the outer skin, or epidermis, the inner or corium, and underneath this a third layer consisting of fat. If you allow your skin to be so blistered by the sun that some of it comes off, it is actually the

complete epidermis which comes away. This epidermis is found, under microscopic examination, to consist of four distinct layers of cells. The lowest is the Malpighian layer, which is a kind of sun-ray filter. Through it comes the supply of ultra-violet light from the sun. The upper layers are more in the nature of a protection to the all-important Malpighian.

Although there are in addition to the ultra-violet rays other important sun-rays affecting the human body, called infra-red rays, it is with the ultra-violet type that we are concerned from the point of view of sun-bathing. There is no doubt at all that if it is properly made use of sunlight is a limitless source of health. It has been found that the natural rays of the sun can be used with great success on a very large number of cases of general debility, as well as such ailments as rickets, tuberculosis, ulceration and wounds of all descriptions. In the summer-time there is, of course, the maximum amount of ultra-violet radiation, and in making up our minds how to make the best possible use of this valuable thing which comes from the sun, we have to consider once more our Malpighian cells. It is these which determine whether we have a fair skin or a dark skin. Thus our complexions are dependent upon these cells.

The darker-complexioned person has greater powers of resistance to the sun than the fair one. This is noticed at once when sun-bathing. The blonde will find, when exposing her skin to the sun, that it blisters quickly, whereas the brunette can expose herself for hours, and just get nicely bronzed without being blistered. This is because the Malpighian layer of the darker-complexioned person has the greater powers of resistance to the sun. The brunette, of course, must be careful as well, because if she exposes herself to the sun for too long a period she will suffer the same discomfort as the fair one.

Generally, there is no doubt whatever that sun-bathing is an excellent thing, provided the necessary precautions

are taken to ensure that the infiltration of violet-rays is not so sudden and violent as actually to damage the upper layers of the skin.

VITAMINS

Ultra-violet rays give rise to Vitamins, of which there are four principal varieties: Vitamin A, which is anti-infective; Vitamin B, which is the nerve vitamin; Vitamin C, which prevents scurvy; Vitamin D, which prevents rickets and builds sound bones and teeth.

The main function of Vitamin D is to assist the absorption by the body of calcium and phosphorus. This is why it is valuable for bone- and tooth-building, and why the lack of it causes rickets. It is obtainable from milk, butter, kidney, liver and yolk of egg, and it can be made in the laboratory by irradiating ergosterol with ultra-violet rays. No doubt this is why cow's milk is richer in Vitamin D during the summer months than in the winter, i.e. because the sunshine is giving it good doses of ultra-violet rays.

A curious fact is that two of the richest sources of this vitamin are the liver oils of cod and halibut, both of which are deep-sea fish and get no sunshine. This is a mystery as yet unsolved, and so is the mystery as to how the vitamins work inside our own bodies.

There is also a connexion between Vitamin C and the bones, which become brittle if starved of this vitamin. Further, Vitamins A and B have been found to have something to do with keeping healthy the sockets in which our teeth rest.

The truth that it is possible to have too much of a good thing applies to vitamins; thus, if you have too much of Vitamin D you get too much calcium in the body, and chalky deposits appear in the heart, the blood-vessels, the stomach and the lungs. Weight is rapidly lost, and if the process is not checked, death ensues.

Vitamin A, like Vitamin D, is present in milk and

butter, and when experiments were made in the production of synthetic milk, it was found that both of these vitamins were absent. Vitamin A is made by sunshine out of Carotene, which provides the colouring matter of carrots. Cod-liver oil is also a rich source of this vitamin, and the same mystery arises here as in the case of Vitamin D as to how the fish, which produced the cod-liver oil, manufactured this vitamin in the absence of sunshine.

A schoolboy once said of the Battle of Waterloo that it was "a very important battle about which not much is known." He might have said the same about the activities of Vitamin A. However, it is definitely known that in some mysterious manner it is necessary for normal growth and promotes general stamina. It should be noted that, in company with Vitamin D, it is very necessary for expectant and nursing mothers.

Students of history, and readers of stories of adventures at sea in the old sailing days, are aware that one of the great difficulties to be faced in the long sea journeys of those days was the deprivation of the crews of fresh food for long periods. The result was scurvy. It was found that the juice of lime prevented this disease, and now it is known that the reason for this is that it is rich in Vitamin C. Some authorities believe that Vitamin C, or rather its absence, is connected with rheumatism and intestinal tuberculosis.

There are several varieties of Vitamin B which are labelled B₁, B₂, B₃, B₄, B₅, B₆ and a possible B₇. This is the vitamin which is responsible for the popularity of brown bread, and it is to be found in varying categories in cereal grains, milk and brewers' yeast. B₁ keeps the appetite up, stimulates and produces the gastric juices and plays an important part in the control of the automatically operated muscles of the body. It is also an important factor in the health of the sex glands, and of the intestine. It has some connexion with the skin, because it cures certain skin diseases.

One of the characteristic problems of modern times is that of strengthening the vitamin content of canned food and vegetables. The Lister Institute has been experimenting in adding Vitamin C to canned apples, runner beans and spinach. A certain degree of success has been achieved.

There is a definite connexion between vitamins and the colour of certain foods. It is well known that, before such things as vitamins had ever been heard of, it was customary to praise good yellow farmyard butter, and red sun-ripened apples. Now we know that if the yellow in the butter is natural, it is due to the presence of Carotene, the parent substance of Vitamin A, and so has a definite health value. And so it is with red apples.

EXAMINATION QUESTIONS

1. To what uses can electricity be put in the home? What are its advantages and disadvantages for such uses?
2. Why is it important to keep the nose and mouth healthy, and how can this be done most simply?
3. What is artificial silk and for that purposes is it used? How do you account for the rapid growth of the industry in England.
4. Amplify and illustrate the statement that a revolution in production as far-reaching as the application of steam power has taken place since the First World War.
5. Explain, with an example, the meaning of "the rationalisation of industry."
6. Give a brief account of the development of acoustics.
7. Give a brief account of the effect of the World Wars on scientific research.
8. How are ultra-violet light and X-rays produced? Describe their use in medical practice.
9. In what ways would a community be likely to benefit from a cheap supply of electric power?
10. What are the chief contributions of chemistry to agriculture?
11. What effects, harmful and beneficial, are produced by exposure of the body to the sun's rays? How can the beneficial effects be obtained by artificial means?

12. Describe the attractions of a branch of natural history in which you are interested.

13. What do you know of the atomic bomb, molecular and atomic disintegration?

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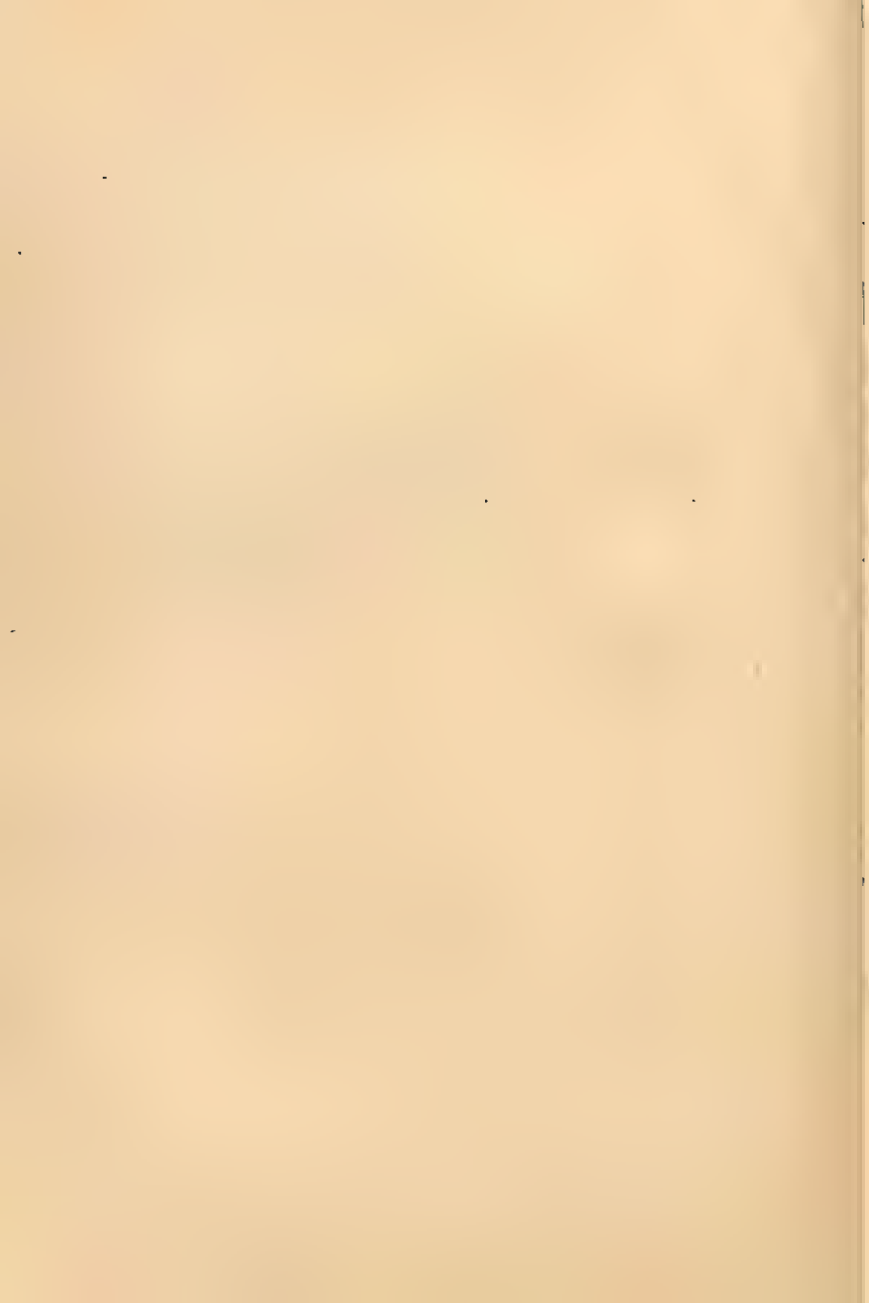
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PART III

HOW WE ARE GOVERNED

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CHAPTER XII

THE FUNCTIONS OF THE CENTRAL GOVERNMENT

*Why we need a Government—Parliament—Elections—
House of Commons—Bills—House of Lords—The
Great Officers of State—The Judiciary—The Jury
System—The High Court—The Judicial Committee of
the Privy Council—The Civil Service.*

WHY WE NEED A GOVERNMENT

WE all value our personal liberty and security. We all want to be able to live our lives with as little interference as possible from without. One reason, therefore, why we have a Government is to protect us not only from interference from within, but also from interference from without. Hence, we require police, an army, a navy and an air force, which it is the business of the Government to provide. Over and above this, a country like our own has interests in all parts of the world and trade in every continent; has ships carrying that trade across the seas to every part of the globe and requires protection for its commerce.

Since the advent of universal suffrage, every person over 21, whatever their occupation, has had a share in deciding what the Central Government shall do. They have decided that their children must receive the best possible *Education*, and have called upon the Central Government to provide it.

Since the workers have organised themselves into Trade Unions, and since the employers have become imbued with modern scientific ideas, *National Health* has

become a matter of prime importance, and the Central Government has assumed a large share of the responsibility for seeing that a high standard is maintained.

The nation has insisted of recent years that the Government should undertake the responsibility, not only of seeing that unemployed persons are provided with the wherewithal to keep the wolf from the door, but also to see that, as far as possible, jobs are found for them. Hence the Ministry of Labour Unemployment Department, with its scheme of insurance against unemployment, and payment of unemployment benefit; and also the Labour Exchanges.

The Governments of the civilised nations of the West have also endeavoured to bring about a reasonable standard of living among the people, and although a minimum wage has not been widely adopted in this country, the Central Government has taken an increasing part in endeavouring to promote reasonable rates of wages throughout the country, and to secure that the hours of labour are not excessive.

PARLIAMENT

The responsibility for the government of the country rests with Parliament.

How does Parliament come into being? We are all familiar with Parliamentary elections. Every few years everyone gets very excited, posters and loud speakers bombard us with advice as to the manner in which our votes should be cast, and motor-cars dash about here, there and everywhere, carrying the voters to the Polling Booths.

ELECTIONS

The first step in an Election is the issue of a writ by the King to the Sheriff of every county and the Mayor of every borough in the kingdom, ordering them to procure in their own locality the election of one or more

persons to represent that locality. For this purpose England, Wales, Scotland and Northern Ireland are divided into constituencies, each of which is called upon to elect one or more representatives totalling 640 in all.

When the Sheriff or Mayor receives the King's writ, he calls for the nomination of candidates, who must be proposed by an elector, and seconded and supported. Between the time of nomination and the day of election there is usually about a fortnight's interval, during which each candidate does his best to persuade the constituency to elect him.

On the day of the election, the voters go to the *Polling Station*, where they receive a slip of paper bearing the names of the candidates. The voter places a cross against the name of the candidate chosen by him or her, folds it up and places it in the ballot box. Voting is secret, and no one can know how anyone has voted unless he chooses to disclose it. The Polling Stations are all closed at a fixed hour. The ballot boxes are then sealed up, and taken to the Town Hall where they are opened in the presence of the Returning Officer. The votes are then counted, and the candidate who gets the greatest number of votes is declared elected.

HOUSE OF COMMONS

The Members having been duly elected present themselves at the House of Commons, take the oath and elect the Speaker (chairman). Every meeting of the House is preceded by prayers read by the Chaplain. It should be explained that first of all the Speaker enters the Chamber accompanied by his Chaplain and staff. After reading the prayers, the Chaplain retires, and the political business commences.

The first hour is known as Question Time, during which any Member of the House may ask a question of a Minister of the Crown. This is a very important hour,

for it is one in which Parliament is able to criticise and exercise its control over those whom it appoints to carry out the duties of Government.

Question time being over, the Speaker orders the Clerk of the House to announce the first business of the day. Normally this consists of the discussion of a Bill which is submitted to the House for its approval. Bills normally fall into three classes:

BILLS

(1) Money Bills, that is, Bills proposing that Parliament should sanction the expenditure of money, and the procedure for raising it from revenue. These can only be introduced by the Government.

(2) Bills put forward by the Government or by a private Member, usually with the support of a section of the House, are part of the ordinary public legislation.

(3) Private Bills which are put forward on behalf of some private interest, or some particular locality or enterprise.

Bills, before they become Acts of Parliament, must pass through the following stages:

(1) They must be introduced by a Member, and if approved by the House are said to have passed their first reading.

(2) The Bill is then printed and brought forward for a second reading. This is the stage at which the Bill is fully discussed. If it passes its second reading it reaches its third stage.

(3) This is the Committee stage. The Committee consists either of the whole House in session or of a small number of Members who sit in a Committee room. At this stage the Bill is subjected to a minute examination, and receives all the necessary amendments.

(4) The Bill as amended is then reported to the House. This is called the Report stage and is the fourth stage

where further amendments may be proposed and incorporated in the Bill.

(5) Third reading. The Bill is now voted upon for the third time.

At each of the readings of the Bill what is called a Division takes place. That is to say, the Members walk into one or other of the two Lobbies which run on either side of the Chamber. Into one Lobby go the "Ayes," that is to say, those who are voting in favour of the Bill, and into the other, the "Noes," i.e. those who are voting against it.

A Bill may be introduced in the first instance into either House. When it has passed its third reading in that House, it goes into the other House: i.e. if it is introduced into the House of Commons, it goes after passing the third reading to the House of Lords; if it is introduced into the House of Lords, it goes after its third reading to the House of Commons.

When it has passed through all its stages in both Houses it is presented to the King for his Assent.

HOUSE OF LORDS

The House of Lords consists almost entirely of hereditary Peers. There are a number of Peers whose titles are not hereditary, including the Bishops and certain "Law Lords." Peers are usually divided into two classes. First we have the Temporal Peers of the United Kingdom—Dukes, Marquesses, Earls, Viscounts and Barons who number 700 persons. These sit in the House by hereditary right, or because the King has made them Peers. Next we have the 26 Spiritual Peers, i.e. the Archbishops and Bishops. The Archbishops of Canterbury and York and the Bishops of London, Winchester and Durham are entitled in their own right to sit in the House of Lords. The other 21 are summoned according to their seniority. In addition to the above two groups there are a few dis-

tinguished lawyers who are created as Peers for life only, in order to help the House in its judicial work. It should be remembered that no peer may attend the House until he has received a special summons from the King, called a writ of summons.

THE GREAT OFFICERS OF STATE

The ancient and dignified office of *Speaker* of the House of Commons was in former times filled by nomination by the King, and was the chief channel of communication between the King and the House of Commons. At present he is elected by the House, but his appointment must be approved by the King before he can take the Chair. As soon as he has received the King's approval, it is his duty to claim from the King the historic rights and privileges of the House of Commons. This, of course, is purely a matter of form.

The Lord Chancellor, who sits on *The Woolsack*, which is a kind of ottoman in the House of Lords. He is the equivalent in the Upper House of the Speaker in the House of Commons.

First Lord of the Treasury, whose office is usually combined in modern times with that of *Prime Minister*. Originally, before the War, the Prime Minister used not to exercise any departmental functions. Eventually, however, his duties became so onerous that the Cabinet's Secretariat was set up. This body has now become permanent. The First Lord of the Treasury is in virtue of his office nominally responsible for the control of expenditure. The actual control of the Treasury is, however, in the hands of the Chancellor of the Exchequer.

The Chancellor of the Exchequer occupies a position second only in importance to that of the Prime Minister. He is responsible to Parliament for the work of the Treasury. The Chancellor is also responsible to Parliament for the regulation of taxation, and the collection of revenue

through the Boards of Inland Revenue, and of Customs and Excise.

It is the business of the Chancellor of the Exchequer to lay the departmental estimates before Parliament, and to conduct the Finance Bill through the House. It is necessary for him and his officials to keep in close touch with the financial Heads of Industry and, in particular, with the Bank of England, and the other great Banks.

The Secretaries of State are descended historically from the King's Secretary of State, and represent the branching out of his functions as the business of government grew more complicated. There are now seven: The Secretaries of State for Home Affairs; Foreign Affairs; War; Commonwealth Relations; the Colonies; Air; and Scotland.

The First Lord of the Admiralty is a modern creation. The King's Navy was in past times controlled by the Lord High Admiral, who was responsible direct to the King. But in these days when the Sovereign Power of the Realm resides in Parliament, the First Lord is appointed by that body, and is a member of the Government.

THE JUDICIARY

Parliament makes the Laws, but *the Carrying out and Administration of the Law* is in the hands of the Civil Service and the Judiciary respectively. We shall give later some description of the function of the Civil Service. What do we mean by the Judiciary?

The Judiciary is a name given to the body of men who interpret and enforce the Laws through the instrumentality of the Courts of Law. The leading figures in the Judiciary are, of course, the Judges, who are assisted in the exercise of their functions by the members of the legal profession and by the police. They are also assisted by that exceedingly important factor in our judicial system, the Jury. It will perhaps give a clearer picture of the

machinery of the judicial system if we work from the bottom upwards.

In the first instance, an offender against the Law appears before a Magistrate in a Police Court, where, if the offence is trivial, the case will be tried, and the offender, if guilty, will either be fined or sent to prison for a short period.

If the offence is serious, and the Magistrate is of the opinion that there is a case for trial, he will send the case up to a superior court known as Quarter Sessions. In the country districts and the smaller towns, the Justices in Quarter Sessions are always the County Magistrates, who are not professional lawyers. In the larger towns, the Quarter Sessions are presided over by professional lawyers, and are known as Recorders. The courts of Quarter Sessions are empowered to try criminal offences referred to them by the police courts. Certain very serious crimes (e.g. murder) *must* be referred to the High Court of Justice, which is held either in London or in one of the Assize towns in various parts of the country.

THE JURY SYSTEM

The Jury System is one of the oldest of our British institutions, dating as it does from before the Norman Conquest. The Jurors are not trained lawyers. They are selected at random from among ordinary citizens, and are only expected to exercise common sense and fairness.

The Judiciary is not only concerned with offences against the Law, but adjudicates in legal disputes and claims between individuals or corporations. If the dispute is a minor one it can be dealt with in the County Court, which is always presided over by a Judge, who is a trained lawyer of at least ten years' standing, and is appointed and removable by the Lord Chancellor. About one million cases per annum are dealt with in these

Courts. They deal with a great variety of cases, including claims against debtors and minor bankruptcy cases, and are usually dealt with by the Judge without a jury, which, however, either party may claim if they wish to do so. An appeal lies from the County Court to the High Court, but is very rarely exercised, which seems to indicate that the public is very well satisfied with the judgments given by these Courts.

THE HIGH COURT

The High Court consists of (1) the High Court of Justice; (2) The Court of Appeal.

The High Court of Justice is divided into:

(1) *The King's Bench Division*, which deals with criminal cases, and many civil cases.

(2) *The Chancery Division*, which deals with equity but not the common law.

(3) *The Probate, Divorce and Admiralty Division*, where Wills, Matrimonial cases and Shipping matters are dealt with.

Appeals lie from these Courts to the *Court of Appeal*, and beyond that to the House of Lords, where the Lord Chancellor presides over a court of six professional Judges, known as the Lords of Appeal in Ordinary.

THE JUDICIAL COMMITTEE OF THE PRIVY COUNCIL

The Judicial Committee of the Privy Council is a Court constituted to hear appeals from the Dominions, Colonies and Dependencies, and to decide questions of Ecclesiastical Law. When the last type of question is being dealt with, the Archbishops and such Bishops as are members of the Privy Council are sometimes called in as Assessors, to assist the Committee with their expert advice. As an illustration of the type of work done by this Court, one might cite disputes between Indians, or questions arising

out of fishery rights in Canada, or again, an appeal from the South African or New Zealand Court, and so on. This is the one court which exercises jurisdiction in the Overseas Dominions. But this jurisdiction, as far as the self-governing Dominions are concerned, is only exercised at their request in specific cases.

THE CIVIL SERVICE

The Civil Service can be traced back to the fourteenth century, when we know that the great poet Chaucer, author of the "Canterbury Tales," was a Collector of Customs. Many great poets and literary men have figured in its ranks, including Spenser and Milton. In earlier times, the Civil Service was recruited by very different methods from those prevailing to-day. Many of the younger sons of aristocratic families found their way into it, and appointments were often given as rewards for services to the King's Ministers, or to the King himself. In its earlier days it was probably a very leisurely occupation and, no doubt, many functionaries found opportunities for feathering their nests.

All this kind of thing was brought to an end during the last half of the nineteenth century, when recruitment by open competitive examination was introduced. The old idea that the Civil Service was an easy job died hard. It was a saying at one time that the Civil Servant was comparable to the fountains in Trafalgar Square, which played from 10 to 4 every day. Until the beginning of the Great War, there were still some survivals of the old state of affairs, that is to say, there were still a number of "soft jobs."

When the Great War came the Civil Service was seriously depleted owing to the large number of men who joined the colours, and the responsibilities which devolved upon those who remained behind were extraordinarily heavy. The permanent Civil Servants, who were re-

tained on civilian duty, formed the nucleus of the tremendous administrative machine which was required to stand behind the fighting forces. After the War, there occurred a rapid development of the social services, which threw more and more work upon the Service. The Post Office and the Inland Revenue expanded far beyond their pre-war limits, and two great new departments, the Ministry of Labour and the Ministry of Health, came into being for the purpose of administering the Social Services. In addition to these the Ministry of Pensions was created, whose staff at one time exceeded 20,000, and the Board of Trade experienced a period of great expansion, whilst in recent times the Department of Customs and Excise has been greatly increased in order to cope with the work arising out of the imposition of Tariffs.

For the purpose of administrative, accounting and other expert work, and of clerical work, the Civil Service is divided into three classes, known as Administrative, Executive and Clerical. There is also a Technical Service in the various departments consisting of professional men, such as Doctors, Architects, Engineers, Chemists and Lawyers. The three classes above mentioned are recruited by open competitive examination under the supervision of the Civil Service Commission. The control of each department is in the hands of the Administrative Staff, recruited by a competitive examination which virtually requires the previous attainment of a good Honours degree at one of the principal universities. From this class are recruited the officials who subsequently rise to the principal positions in the Service, viz. Secretaries, Principal Assistant-Secretaries and Assistant Secretaries. Most of the men who hold these posts have graduated through private Secretaryships to Ministers and permanent heads of departments.

The Executive class is recruited by an open competitive examination available to boys and girls between the ages of 18 and 19. The examination corresponds roughly to

the intermediate B.A. of London, but, owing to its competitive nature, the standard is very high. This examination is intended to attract the more advanced post-matriculation students in the secondary and public schools, and has so far been successful in achieving that object. These officers are trained to occupy important key positions. Most of the detailed finance and accountancy work is done by this class, which also fills controlling posts in Contract and Supply departments and Inspectorates.

The Clerical class is recruited by open competitive examination, available to boys and girls between the ages of 16 and 17. The standard is approximately the same as the Matriculation examination. The Clerical Officers perform the clerical work of the Service, and are assisted in purely routine work by Clerical Assistants who are also appointed by open competitive examination available to girls only, between the ages of 16 and 17. This examination is of a less advanced character than the clerical examination. These Clerical Assistants are really the junior clerks of the Service.

In addition to the above and to the Professional Officers there are about 300,000 Civil Servants who belong to what are known as the Manipulative Classes, consisting of Postmen, Messengers, Sorters, Caretakers, Machine hands, etc.

The Civil Service has its Whitley Councils. There is the Civil Service National Whitley Council, representing the Service as a whole, and there are departmental Councils in every department. These Councils consist of an official side and a staff side, corresponding to the employers and employed in the industrial Whitley Councils. The Civil Service National Whitley Council deals with salaries, hours, leave and conditions of service affecting the Service as a whole, whilst the Departmental Councils deal with such matters as promotion, discipline and accommodation affecting the particular department only.

The following is a list of appointments in the Civil Service recruited by Open Competitive Examination, together with the age limits between which candidates are allowed to enter for the examination. Copies of the regulations under which these examinations are held are issued by the Civil Service Commissioners to anyone who applies for them. These regulations are subject to alteration from time to time. The examinations are, of course, only held when a sufficient number of vacancies exist in the Civil Service, in the particular class of appointment involved, to justify the holding of an examination. The Civil Service Commission advertises forthcoming open Competitive Examinations in the principal daily newspapers.

	Age Limits.
Junior Grade of the Administrative Class in the	
Home Civil Service	21-24
Indian Civil Service	21-24
Burma Civil Service (Class I)	21-24
Ceylon Civil Service	22-24
Foreign Office and Diplomatic Service	21-25
Consular Service and Assistant Officer Grade in the Department of Overseas Trade	21-25
Assistant Inspector of Taxes, Inland Revenue, and Third Class Officer, Ministry of Labour.	21-24
Assistant Examiner in the Patent Office, Board of Trade	20-25
Assistant Examiner in the Companies (Winding- up) Department, Board of Trade	20-24
Executive Group of Situations	18-19
Cartographer in the Hydrographic Department of the Admiralty	19-25
Officer of Customs and Excise (Male)	19-21
Probationary Inspector (Male), Engineering De- partment, General Post Office	18-23.
Male Assistant Traffic Superintendent, Post Office Telephone Service	18-23.

	Age Limits.
Male Assistant Preventive Officer in the Water-guard Service, Customs and Excise	19-21
Unestablished Draughtsman, Ministry of Agriculture and Fisheries	19-23
Non-established Junior Technical Examiner (Male) in the Lands Branch of the War Department	18-22
Clerical Classes, General and Departmental	16-17
Clerical Assistant, Grade I (Female) in the Civil Service generally and Clerical Assistant (Female) in Offices of Inspectors of Taxes under the Inland Revenue Department, in London and Provincial Offices	16-17
Typists and Clerk-Typists (Female) in Government Departments	16½-25
Telegraphist (Female) in London, Post Office Telegraphs	16-20
Sorting Clerk and Telegraphist (Male) on the Postal side of certain Provincial Post Offices	16-18
Sorting Clerk Telegraphist (Female) in certain Provincial Towns, Post Office	16-18
Sorting Assistant (Female), Post Office, London	15-17

The above information relates to the Civil Service prior to the outbreak of the Second World War. Recruitment by examination ceased during the war. The Civil Service is, at the date of publication of this edition, in course of reorganisation. The latest information regarding posts and examinations can be obtained from H.M. Stationery Office or from the Civil Service Commissioners.

CHAPTER XIII

THE INSTRUMENTS OF CENTRAL GOVERNMENT

The Meaning of Central Government—Whitehall—The Admiralty—The Treasury—Downing Street—Home and India Offices—Labour, Education and Health—Board of Trade, Ministry of Works and Buildings and Others—The Revenue Departments—The Post Office—Ministry of Agriculture and Fisheries—The Ministries of Supply and Aircraft Production.

THE MEANING OF CENTRAL GOVERNMENT

TO those of us who have not come in direct contact with the Central Government, it may seem an abstraction; something talked about and heard of but never seen, like the giraffe in Kipling's story "How the Leopard got his Spots." The leopard complained that when he and the Parsee found their way into the woods, where the ground was speckled and streaked by the sunlight coming through the trees, he could "smell giraffe and hear giraffe" but he could not see giraffe.

If you have had dealings with the Inspector of Taxes, you do not feel that the Central Government is a flimsy abstraction; you have felt the weight of its arm, seen its edicts on a printed form; you have possibly even spoken face to face with one of its officials in the discharge of his duties. If you have not yet left school, these things may not seem very real to you. If, however, you are being educated at a secondary school you are, although you may not realise it, in direct contact with the Central Government, which is bearing a large proportion of the cost of your education. It may interest you to know that your education is costing the State £45 per annum.

WHITEHALL

No better way exists of bringing home to anyone the reality of the Central Government, than inducing him to take a walk down Whitehall from Trafalgar Square to the Houses of Parliament. As you leave the square you will notice on the right the Admiralty Arch, through which can be seen the vista of the Mall with the Victoria Memorial in the distance standing out white against the background of Buckingham Palace. You will notice on the Admiralty Arch many windows. Behind these windows are the rooms occupied by the officials carrying out the work of the *Board of Admiralty*. As you walk down Whitehall, you will find on the right-hand side an ancient building with a courtyard, the entrance to which is flanked with columns of Portland stone, blackened with age. This is the self-same courtyard across which Mr. Secretary Pepys (famous for his diary) walked morning after morning to his duties as Secretary to the Admiralty. Across this same courtyard must have walked in their time all the famous Admirals and Captains whose names are household words throughout the land.

THE ADMIRALTY

Here, therefore, we have our first outward and visible manifestation of the Central Government, which through the department known as the Admiralty rules the King's Navy. Here the Sea Lords sit in conclave in the Board room, presided over by the First Lord of the Admiralty, who is a member of the Cabinet, and represents the Navy in Parliament. In this place the central organisation of the Navy is carried out. The vast expenditure is dealt with from the accounting point of view by the department of the Director of Navy Accounts, and the headquarters of the Naval Intelligence Division are to be found in this building. Other all-important matters conducted from these headquarters are Naval constructions, engineering, ordnance, stores and victualling.

There is also an important business side to the activities of this department, such as the making of contracts, and the control of the purchase of materials. The administration of the Naval Dockyards throughout the British Isles and throughout the world is also directed from this centre. The Admiralty casts its shadow far and wide from Portsmouth and Plymouth, to Gibraltar, Malta, Hong Kong and Singapore.

After passing the entrance to the Admiralty, we come to another building blackened with age, the office of the *Paymaster-General*, who might be described as a kind of Lord High Cashier to the Government, dealing as he does with the payment of salaries, which in a Civil Service consisting of hundreds of thousands of persons, involves financial operations on a considerable scale.

THE TREASURY

After passing the office of the *Secretary for Scotland*, we come to the Treasury. This is the headquarters of the Chancellor of the Exchequer.

The Permanent Secretary of the Treasury is responsible to him. This official holds the most responsible post among the Permanent Officials of the State. His department revises and approves all the estimates prepared by the other departments before they are submitted to Parliament. The vast sums of money voted by Parliament every year for the conduct of the nation's business are administered by this department. Every penny of the 800 million pounds expended every year by the Government in the administration of the nation's affairs is controlled by this department.

Looking back for a moment, we see on the opposite side of Whitehall, confronting the Admiralty, an imposing building. This is the *War Office*, where the Secretary of State for War supervises on behalf of Parliament the administration and finances of the armed forces on land.

On the same side as the Treasury at the Westminster end of Whitehall are the headquarters of the *Secretary of State for Air*. The *Minister of War Transport* has his offices in Berkeley Square. It is hardly necessary to say much about the activities of these departments as both the Royal Air Force and the operations of the Ministry of War Transport are familiar to most people, but they do illustrate two spheres in which the Central Government plays an important part in our lives. Whenever we see an R.A.F. Squadron passing over our heads in close formation, it is as well to remember that there is a Government department in Whitehall, whose activities are responsible for its existence. Similarly, a Government department stands behind the arterial roads, the pedestrian crossings, the traffic lights, the roundabouts and all the other features of road-transport organisation.

DOWNING STREET

Leaving the Treasury we come to a turning out of Whitehall on the right called Downing Street. If we turn along here we will see at No. 10, *Downing Street*, the official residence of the *Prime Minister of England*, who presides over the Central Government. On the opposite side are the palatial buildings of the *Foreign Office*, presided over by the Secretary of State for Foreign Affairs, who represents the British Government in all its dealings with foreign countries.

Turning back towards Whitehall, we pass on our right the *Office of the Secretary of State for Commonwealth Relations*, presided over by the Secretary of State, through whom the British Government conducts all its official dealings with the Dominions.

The *Colonial Office*, situated in Church Street, Westminster, behind the Abbey, deals with the non-self-governing Dominions. The student should clearly understand that the Commonwealth is now divided into two parts:

one is governed direct from Whitehall, and the other consists of independent nations united only by their allegiance to the Crown, and their common racial traditions. The latter group consists of Great Britain, Canada, South Africa, New Zealand and Australia, India, Pakistan and Ceylon.

The Commonwealth Relations Office deals with the relations between Great Britain and these other independent members of the Commonwealth.

HOME OFFICE

Turning into Whitehall, we find on our right the *Home Office*. The member of the Government in charge of this department is the Secretary of State for Home Affairs. The activities of the Home Office extend from Criminal Law to the supervision of factories, the control of alien immigration, and the administration of Acts of Parliament affecting children, animals and inebriates. It is also responsible for the inspection of explosives and dangerous drugs, and for the inspection of the Constabulary.

The Home Office is also responsible for civilian defence against air raids (A.R.P.).

LABOUR, EDUCATION AND HEALTH

The *Ministry of Labour* in peace-time administers the Unemployment Insurance Scheme, and this department also deals with unemployment assistance, labour exchanges and trades boards, which were established to regulate the conditions of labour in certain trades, whilst the industrial relations division conducts negotiations in certain circumstances between employers and trade unions.

Its functions are now vastly enlarged. It controls and directs the employment of every individual citizen, the recruitment for the Army, Navy and Air Force, and demobilisation.

The Minister of Education is in charge of elementary and secondary schools, technical and continuation schools and training colleges, as well as of the principal museums such as the Victoria and Albert Museum and the Science Museum at South Kensington.

The Ministry of Health has widespread ramifications throughout the national life. This Ministry is responsible for Public Health. It has a great medical staff whose constant concern is the supervision and maintenance and improvement of the nation's health. In the carrying out of these functions, the department employs doctors, dentists, bacteriologists, sanitary engineers, a salvage inspector, inspectors of alkali works, milk inspectors and inspectors of the welfare of the blind. The Ministry of Health is also responsible for the supervision of local government, and in this connexion administers the Housing and Town Planning Acts, employing a staff of architects and other technical officers for this purpose.

The Minister of Health is responsible for the Post-war Housing Scheme.

BOARD OF TRADE, MINISTRY OF WORKS
AND BUILDINGS, AND OTHERS

The *Board of Trade* is in the charge of a Cabinet Minister known as the President of the Board of Trade. The functions of this department are manifold. The Mercantile Marine Department deals with merchant shipping, and includes the general register and record office of shipping and seamen.

Commercial treaties and matters affecting our trade with foreign countries are dealt with by the Commercial Relations and Treaties Department, and there is also a branch dealing with industries and manufactures, including the Gas Administration and Standards Division. Other matters dealt with by the Board of Trade are bank-

ruptcy, the winding-up of companies, the census of production, patents and trade marks.

The Board of Trade is now responsible for the direction of the country's industry and commerce. This department has been entrusted by the Government with the colossal task of guiding industry from War to Peace, controlling the distribution of materials and planning the expansion of the country's export trade.

The *Ministry of Works and Buildings*, formerly known as His Majesty's Office of Works, is concerned with the erection, maintenance and repair of all buildings required for the Public Service, and with the custody of the Royal Parks and Royal Palaces. At a time when great public functions are being held, such as the Coronation of the King, this department is responsible for the erection of stands along the route of the Royal procession and for the distribution of tickets. It was also entrusted with the work of erecting the annexe to Westminster Abbey which was used for the robing of the Monarch and his retinue prior to the procession in the Abbey itself.

This department also has experienced a vast extension of its functions since the outbreak of the Second World War. It has been responsible for the requisitioning of land and buildings for various other Government departments and for the allocation of building materials. It will play an important part, in conjunction with the Ministry of Health, in the housing programme.

The office of the *Commissioners of Woods, Forests and Land Revenues* was at one time connected with the Office of Works, but is now a separate department, responsible for the management of all the Crown Lands except the Duchies of Lancaster and Cornwall. The *Chancellor of the Duchy of Lancaster* is a member of the Government although not always of the Cabinet. One of its important functions, Afforestation, has become of paramount importance.

Government departments have now extended far beyond the confines of Whitehall. An important department, which is domiciled at Blackpool, is the *Ministry of Pensions*. This department is responsible for the payment of pensions to persons disabled during the World Wars and to the widows and dependants of those who were killed or died as the result of service. Here again, we find a great administrative machine whose activities extend throughout the length and breadth of the land. This Ministry is not only engaged in paying pensions, but is actually caring for in hospitals, and providing treatment for, persons of both sexes who are still suffering from the effects of disablement incurred during the Great Wars.

Another great department which came into being during the Second World War is the *Ministry of Fuel and Power*. One of the most important functions of this department is the Inspectorate of Mines, which supervises the conditions under which work is conducted in the mines, with a view to ensuring the safety of those employed therein. A number of important committees work under the Secretary for Mines. There is, for instance, the Advisory Committee for Coal and the Coal Industry, the Advisory Committee for the Metalliferous Mining and Quarrying Industry and the Health Advisory Committee. This Minister is also responsible for the Board for Mining Examinations, the Miners' Welfare Committee, the Safety in Mines Research Board and the Coal Mines National Industrial Board.

This Department will be responsible for the Nationalisation and subsequent control and direction of the Mining Industry. It also controls the supply and distribution of petrol, oil, gas, electricity and other sources of fuel and power.

The *Ministry of Social Security* is a new department which will put into operation the Government's version of the "Beveridge Plan." This department will absorb

the functions of the National Health Insurance Department, the Unemployment Insurance Department, and the Public Assistance Board.

THE REVENUE DEPARTMENTS

We have not yet mentioned the *Inland Revenue Department*, whose headquarters were at Somerset House in the Strand until evacuated to Llandudno. As indicated by its name, the business of this department is to collect much of the nation's revenue and pay it over to the Treasury. It only deals with revenue collected from sources within the confines of Great Britain. The revenue derived from taxes upon goods imported from abroad is the function of the Customs Department.

One of the principal functions of the Inland Revenue Department is the collection of Income Tax. The department has its Inspectors stationed all over the country, whose business it is to assess the amount of tax to be paid by every individual or association and to collect it.

The Death Duties are also collected and assessed by the Estate Duties Office, under the Inland Revenue Department under which there also functions the Office of the Controllor of Stamps and Registrar of Companies, Business Names, Newspapers and Bank Returns. In Somerset House, also, is the General Register Office, where is kept the register of Births, Deaths and Marriages. If anyone wants to ascertain the date of birth, or of marriage, or of the death of any person, he can, on payment of a fee, inspect the registers and obtain a copy of the record.

His Majesty's *Customs and Excise Department*, whose headquarters are in the well-known Customs House between London Bridge and the Tower Bridge on the north bank of the Thames, is responsible for collecting the duties imposed by the Government upon certain foreign commodities imported into this country. It is also responsible

for collecting the excise duty on beer and spirits and the purchase tax.

THE POST OFFICE

The Post Office is so familiar to all of us and so much a family affair that many people probably hardly realise that it is a Government department with a Cabinet Minister in charge, and run by Civil Servants. This tremendous organisation does not cost the taxpayer a single farthing. It pays its own expenses out of the income derived from postage stamps, postal orders and money orders and the remuneration it receives from the various services it performs for the public and it pays out 10 millions profit to the Exchequer. In addition to the Telegraphic Service, it runs the Telephone Service, and the number of messages conveyed by this means runs into ten figures every year.

The Post Office, however, does more than carry letters and parcels, and transmit messages; it acts as Banker and Stockbroker to millions of people. This work is done by the Post Office Savings Bank, whose depositors number about 12 millions, with nearly £300 millions standing to their credit. The Post Office also acts as Broker for the purchase of Government National Debt Stock. In this way it is responsible for the investments of £190 millions, representing $2\frac{1}{2}$ million accounts. Between seven and eight million people hold Savings Certificates purchased through the Post Office, and the sum of money standing to the credit of these persons is about £480,000,000.

It will be clear from these facts that the work of the Post Office is stupendous, and we have not even yet given the whole story, for the actual payment of Old Age and Widows' Pensions, Soldiers' Disability Pensions and Dependants' Pensions is also made by this department. It collects the revenue derived from various kinds of Licences and by the sale of Health Insurance and Unemployment Insurance Stamps. It will be understood

why the Postmaster-General finds it necessary to employ a staff not far short of 250,000, about two-thirds of whom are pensionable established Civil Servants. The achievements of Telecommunications Branch of the G.P.O. during the Second World War were stupendous.

The details we have furnished concerning the operations of the various Government departments do not cover, nor are they intended to cover, the whole of their activities. Every well-informed person should know something of the duties assigned to the different Ministers and the Departments over which they preside, and it is hoped that the readers of this book will be helped to form some idea in their minds of the vastness of the modern administrative machine. The existence of these activities is demanded by the necessities of modern civilisation. A modern State is a very complicated affair, and for that reason has been compelled to entrust to a large number of officials the business of holding the organisation together and keeping its various parts efficient.

THE MINISTRY OF AGRICULTURE AND FISHERIES

This department has become increasingly important of recent years owing to the necessity for the nation to produce the greatest possible quantity of food on its own soil.

THE MINISTRIES OF SUPPLY AND AIRCRAFT PRODUCTION

Were created to meet the requirements of war. They have been amalgamated and will continue to function.

CHAPTER XIV

MISCELLANEOUS ASPECTS OF GOVERNMENT

Local Government—The Citizen's Contribution to the Expenses of Government—Electoral Systems—The Political Parties—The Conservative Party—The Labour Party—The Liberal Party—Psychology and Politics—The B.B.C. and Parliament.

LOCAL GOVERNMENT

THE smallest unit of Local Government is the Parish, and the largest is the County. The City or Town Council, though covering a smaller geographical area than the County, is often more important because it contains a larger population and represents more capital and industrial activity. The Town Hall or Council house is usually the headquarters of the Town Council, and its procedure is usually modelled on that of Parliament. The Lord Mayor or Mayor presides, and is assisted by members of the Council, some of whom are known as Aldermen. The Lord Mayor or Mayor is elected every year (in November) by the Council. All members of the Council are elected by the ratepayers.

Every town has a municipal election once a year, but the Councillors are elected for three years, and one-third go out of office every year. Each Council selects from its number a small body of people known as Aldermen, who form a kind of senior committee who are permanent members and not required to be re-elected by the wards.

The business of the Councillors is not to make laws. They have no authority to do so. Their powers are laid down and strictly limited by Parliament. They can, however, make what are known as by-laws, which are

really regulations made with a view to carrying out what is laid down in the Acts of Parliament.

The work of the Council is done by Standing Committees assisted by permanent paid officials. The Councillors can recover their expenses. The functions of these Committees vary. There is, for instance, the Watch Committee, which is responsible for the policing of the town. Then there is the Education Committee. Another deals with Health and Sanitation. Another with the Public Libraries. Another with Tramways and Omnibuses if the Council runs them. Others with gas, electricity, parks, etc.

The duty of the Council varies in different districts. Some run their own tramways and motor-buses, others their own gas and electricity undertakings, and so on.

The annual expenditure of local authorities is not covered by their income. There is therefore an annual deficit, but the local authorities are not allowed to borrow without the consent of the Ministry of Health. They are, in fact, closely supervised by that department.

The reader should extend his knowledge of this subject, and is referred to the Bibliography in Appendix II.

THE CITIZEN'S CONTRIBUTION TO THE EXPENSES OF GOVERNMENT

In what way does the citizen contribute to the national revenue? He contributes in two ways: (1) through direct taxation; (2) indirect taxation. An example of the former is income tax, which is paid by means of levying a tax on incomes. Other examples of direct taxation are dog licences, car licences and stamp duties.

Indirect taxation consists of import duties (e.g. sugar and tea) excise duties, such as those on beer and spirits, and purchase tax.

The citizen is also subjected to taxation by local authorities in the form of rates. This type of taxation is

necessary in order to enable municipal bodies to carry out the duties entrusted to them by the community, such as keeping roads in repair, drainage, lighting, dust collection, medical service. This contribution is also needed to enable the local authorities to maintain the local police system. In the country districts many authorities have to face such questions as the development of water supplies.

The tendency is for both the local authorities and the State to assume greater and greater responsibilities for the welfare of the citizens, and the natural result is a tendency to increase both types of taxation. It is being found increasingly necessary to amalgamate the smaller local government units, in order that the efficiency of the local authority may be increased, and economies effected by co-ordination of activities over larger areas.

ELECTORAL SYSTEMS

The system prevailing in Great Britain at the present time is geographical; in other words, the country is divided up by areas (constituencies), and Members of Parliament are elected by the simple method of declaring successful the candidate who gets the largest number of votes. One great defect of this system is that it tends to deprive minorities of representation in Parliament.

An alternative which has been tried in other countries is the second ballot. Under this system, if there are more than two candidates, a second election is held between the two candidates heading the first election.

Another alternative method is Proportional Representation. Under this system it is usual to have a smaller number of constituencies, each of which sends two or more members to Parliament. The vote is transferable, i.e. the voter indicates the order of his preference for the candidates. He marks his favourite (1), his second favourite (2) and so on.

This system certainly has the advantage of obtaining at

an election a truer indication of the opinions of the whole of the electorate. It is at present actually in operation in University constituencies in Britain, which are entitled to two or more members of Parliament, and it is in general use in the Irish Free State.

One of the alleged disadvantages of this system is that it is much more complicated, and tends towards the creation of a large number of parties, and would undoubtedly make for instability because very few Governments, if any, would have a sufficiently large party behind them to make them independent of the support of other parties. Owing to the lack of a clear majority in the House, Governments would tend to be afraid to do anything definite for fear of offending some of the many sections of opinion in the House.

THE POLITICAL PARTIES

There were three principal political parties in the British Parliament. These were the Conservative, Labour and Liberal. Since the General Election of 1945 it cannot be said that the Liberal Party in Parliament is a major party. The differences of opinion represented by these parties relate to internal economic and social affairs, and to foreign policy. There is one point upon which all three parties are unreservedly agreed, and that is the Monarchical Principle. Another point on which all the parties are agreed is that the best system of government is Parliamentary Government based on Democratic vote or franchise.

The great cleavage between the Labour Party and the Conservative Party is on the question of the control of industry and finance. The Labour Party consider that these should be controlled by the State, whereas the Conservatives would limit State interference to the protection of the public interest. Parliament is constantly dealing with such matters as town planning, education, unemployment, wages and conditions of labour, banking,

industry, local government. The two main parties have many views in common as well as many points of difference on these questions.

THE CONSERVATIVE PARTY

A main plank in the Conservative platform in the past has always been Imperialism. It was, indeed, at one time the great rallying cry of the Party, together with Protection. Both of these rallying cries have now fallen into the background. The Empire appears to have reached the limits of its expansion, and, indeed, over a considerable part of its territory has ceased to be an Empire at all, but has become a Commonwealth of Nations.

The great issue between the Conservative and Labour Parties is that of Capitalism versus Socialism. The Conservatives believe that the best interests of the country will be served by maintaining the present system, whereby industry is based upon private enterprise. State control, they hold, should be kept severely in check and only brought in under the spur of necessity. They did not hesitate to support State control during the war.

The "Tory" Party has always been the political pillar of the *Established Church*. In the past, particularly during the last decades of the nineteenth century, the Church was bitterly attacked and a strong movement grew up towards disestablishment. The Conservative Party resisted all the attacks upon the Church and was successful in defending it. This problem is not under discussion at the present time, but it would be rash to prophesy that it will not crop up again. Whilst the policy of the Conservative Party has undergone considerable changes in many other directions, there is nothing to show that it would not maintain its traditional attitude towards the Church if the latter were challenged.

THE LABOUR PARTY

Before the First World War the Labour Party was com-

paratively insignificant. The government of the country was carried on alternately by the Liberal and Conservative Parties. After the First Great War the Labour Party grew rapidly in importance and the Liberal Party declined.

In the General Election of 1906, twenty-nine Labour members were elected. This caused a great sensation in the political world of those days. To-day the Labour Party is one of the two great parties upon whom rests the responsibility of the government of the country. This party actually took office in 1924, 1929 and 1945.

Unlike many Socialist parties on the Continent, the Labour Party stands for action on strictly constitutional lines, and is opposed to Communism. Its aim is the ultimate establishment by peaceful means of State Socialism in England. Its policy may be summarised as follows: the National Minimum Wage; the Nationalisation of Key Industries; the Nationalisation of Banks; Co-operation in international affairs.

The Labour Party maintains that their policy will secure to everyone those standards of living which are necessary to a healthy, independent and self-respecting existence. They strongly believe in the establishment of International standards of wages and conditions of labour. They propose to convert industry from "a sordid struggle for private gain" into "a co-operative undertaking carried on for the service of the community under their control." The means of production are to be socialised, thus effecting the abolition of waste and profiteering, and of the unfair distribution of the products of industry.

The Labour Party is not at variance with the Conservative Party in principle as regards free education, housing, pensions, care of sickness, maintenance during unemployment, but it is prepared to spend a lot more money on these services than the Conservatives.

THE LIBERAL PARTY

The watchword of the Liberal Party has always been Liberty. They profess to be jealous of the rights of the individual citizen. The Party has done, and still does, very useful work in drawing the attention of the public to encroachment upon personal liberty. They have always directed severe criticism at such enactments as the Defence of the Realm Regulations and the various Sedition Acts, which have been introduced from time to time. The extension of the Suffrage has always been in the forefront of the Liberal programme, and they have also fought for the supremacy of the House of Commons. However, since the limitation of the veto of the House of Lords, and the introduction of universal suffrage, this part of their programme has lost some of its significance.

In spite of its eclipse as a parliamentary force the Liberal Party has considerable support in the electorate, and stands for a great tradition.

As a matter of fact, many of the tenets of Liberalism have been adopted by the other two political parties, who claim that there is now no longer any room for the Liberals in the Parliamentary political system. The Liberals, however, maintain that the Liberal electorate is much larger proportionately than its representation in Parliament, and they claim that the institution of proportionate representation would give them a much larger share of parliamentary seats.

The remaining principal items in the Liberal Programme are Free Trade, Social Reform and World Peace. They still advocate Free Trade, and would abolish the tariffs introduced by the National Government in 1931. They favoured the League of Nations, and in regard to social reform they stand half-way between the Conservative and Labour points of view.

The Liberal Party has played a great part in our national history, particularly during the last hundred

years. Some of the greatest statesmen of modern times have been Liberals. It is generally recognised that the Government which came into power in 1906, and was in office when the European War broke out in 1914, was one of the most talented which has ever ruled this country. It included such great names as those of Lord Asquith, Lord Grey, Lord Haldane, Lord Reading, Mr. Lloyd George and Mr. Winston Churchill.

It was the Liberal Government which steered the country through the critical days in the early part of the First World War, and it should never be forgotten that it was the Liberal First Lord of the Admiralty, Mr. Winston Churchill, who was responsible for the momentous decisions in naval strategy in July and August, 1914, which secured the country against any possibility of a surprise attack from the enemy across the North Sea. Again, it was Mr. Lloyd George who presided over the Coalition Government which was in office during the latter part of the War.

The Liberal Party was responsible for the initiation of most of the social reforms which have been carried out by subsequent Governments. As instances of this we have Mr. Lloyd George's famous budget, in which he spread the burden of taxation more evenly and fairly than ever before, and his great National Health Insurance and Unemployment Insurance schemes. To the Liberals also was due the introduction of Old Age Pensions.

To many to-day it is a source of regret that this great Party, whose ideals rose above class and faction, should now play so little part in the government of the country.

PSYCHOLOGY AND POLITICS

The importance of Psychology to modern Governments can hardly be exaggerated. The problems with which Governments have to deal are becoming increasingly technical and complicated. Rapid changes are constantly taking place in social and economical conditions,

and it is impossible for Governments to succeed unless they keep in close touch with the opinions of the people they are governing, or unless they wield autocratic powers. Even autocratic Governments have to depend to a very great extent upon propaganda to maintain their credit with the people.

In democratic countries it is even more important that the mass of the people should be kept in close touch with the plans and intentions of the Government. This fact is being increasingly recognised in this country, and our Government indulges in propaganda through the Press and by broadcasting to an increasing extent.

The Post Office was the first Government department to appoint a Public Relations Officer, whose business is to study the public mind in regard to matters affecting the Post Office, and advise the department concerning the requirements of the public, and their probable reaction to proposed schemes. This example has, since, been followed by other departments.

THE B.B.C. AND PARLIAMENT

The British Broadcasting Corporation is an illustration of compromise between two principles, namely, private ownership and State ownership. The B.B.C. was granted a Royal Charter, on the ground that "broadcasting has shown itself of great value as a means of education and entertainment," and should be "developed to the best advantage in the national interest."

Under the Charter, the B.B.C. is allowed to conduct a Public Utility Service by means of Wireless Telephony, and to acquire a licence from the Postmaster-General, which lays down the conditions on which this Public Utility Service is to be conducted. The Charter carried with it a monopoly of Broadcasting in the United Kingdom. Parliament granted the B.B.C. a percentage of the licence fees paid by listeners. The B.B.C., therefore, whilst it is not a Government department, and has in-

dependent control over its own staff, is none the less bound to respect the wishes of the Government, as it is dependent upon Parliament for its revenue and for the grant of its licence.

It is necessary to emphasise the fact that it is in no sense a Government department. The control exercised by Parliament is carried out through the annual voting of the funds of the Corporation. Parliament or the Government can exercise pressure if it chooses by refusing its financial support. The B.B.C. is compelled to permit any Government department to broadcast what it likes, and in this respect is compelled to take orders from those departments. Furthermore, the Postmaster-General can, if he considers that an emergency has arisen, take over the B.B.C. stations and control them on behalf of the Government.

CHAPTER XV

DEMOCRACY AND DICTATORSHIP

*Parliamentary Nations—U.S.S.R.—Nations governed
Autocratically—Fascism—Nazism—Japan.*

AT the outbreak of the Second World War on 3rd September, 1939, the leading nations of the world fell into three main groups:

- (1) Those where parliamentary government prevailed.
- (2) The nations grouped under the Union of Socialist Soviet Republics.
- (3) Those which were autocratically governed.

(1) PARLIAMENTARY NATIONS

In this group were to be found the British Commonwealth of Nations, France, United States of America, Belgium, Switzerland, Norway, Sweden, Denmark and Czechoslovakia. In these countries a Parliament is elected on strictly democratic principles for a limited period, and the Government is formed out of the Parliamentary majority. The political freedom of the individual citizen is protected by law. No political organisation has any power to bring pressure, legal or otherwise, upon individuals to secure their support. Peaceful persuasion is alone permissible, and political intimidation is suppressed by law. Governments are subject to parliamentary control, and Parliament itself to an unfettered electorate.

In these countries freedom of the Press is jealously guarded, as well as freedom of religious opinion. Education is strictly non-political and usually non-sectarian. Employment is based on contract, and compulsory labour

is not tolerated. The Law Courts, especially the higher judiciary, are entirely independent of political control.

The armed forces are strictly subject to the sovereign authority of Parliament.

These are the broad lines on which these countries are governed. There are, of course, weak spots here and there, as, for instance, in America, where, until recently, the political "Machines" controlled by the "Bosses" exercised pressure upon the voters by bribery direct and indirect. But since the Roosevelt régime, the power of these organisations has been considerably diminished, and there is no doubt that voting in that country is now much less subject to indirect pressure than was formerly the case.

The growing complexity of modern civilisation, the vast populations with their multifarious wants, are undoubtedly straining the resources of democracy. Parliamentary business is becoming more and more complicated. Parliaments are finding it necessary to delegate their functions to Government departments, and the officials who control them. There is a growing tendency to regulate people's lives. Governments tend to limit the freedom of the individual. Legislation for the improvement of social conditions leads inevitably in this direction. There is a dangerous tendency in human nature to enjoy interfering in the lives of other people. The delegation by Parliament of its powers to numerous officials is perhaps giving an increasing momentum to this tendency. The danger to political democracy probably lies, if it exists at all, in the increasing docility of the citizen when confronted with the powers conferred by the legislature upon Government officials.

(2) U.S.S.R.

To understand the Russian situation, however, it is necessary to study the history and character of the régime. The basis is the Communist Party. This

party, however, does not constitute the official government of Russia, which is based upon the Soviets. These are committees directly elected by the citizens. The local Soviets choose delegates for the provincial Soviet, and the latter send delegates to the All Union Soviet Congress which meets every two years. The Congress elects a Central Executive Committee, which, in turn, elects the Council of People's Commissars, which corresponds to our Cabinet. The chief executive instrument of the Council is the political bureau of the Communist Party.

FIVE-YEAR PLAN

On October 1, 1928, the Government of Russia introduced the Five-year Plan, a scheme whereby the country was to be industrialised. Plans were made covering a period of five years, wherein vast changes were contemplated. It was proposed to install modern plant and machinery, and to institute scientific mass-production. The plan was actually put into operation. Workers in State factories and farms were kept hard at work for long hours, at low wages, in order to keep down the costs of production and secure the greatest possible profit from sales. It was intended that these profits should provide the capital wherewith to carry out the Five-year Plan. The Soviet State was, broadly speaking, the only trader within the confines of Russia, and fixed all prices. It was thereby enabled to decide for itself what profit should be made on the sale of goods. Outside the boundaries of Russia, the Soviet Government was, of course, compelled to sell at world prices, but it was in a position to keep these prices low, owing to the unfettered power it possessed to fix the wages of labour in Russia at such a level as enabled its goods to be sold abroad at low prices. It should be remembered that, since 1918, all sales and purchases by Russia abroad had been conducted through the Soviet Commissary for Foreign Trade.

Russia needed foreign machinery and raw material to carry out her industrialisation. For this purpose she needed foreign currency. This she obtained by the sale of her goods in foreign markets.

The Five-year Plan required the Russian people to submit to considerable hardships in the way of low wages, low standard of living, long hours and compulsory labour. They submitted to these conditions, inspired with the belief that thereby they would bring about a golden age of prosperity and freedom, establishing the superiority of Communism over bourgeois capitalism.

It was not to be expected that a vast scheme of this description could be carried through without a hitch in the time allotted; but there is no doubt that in the main the plan was successful, and that a very big step was taken towards the development of Russia's industrial potentialities. Vast areas still remained undeveloped, but the progress made indicated that there was great scope for productive capital expenditure in the future. One inevitable result of the plan was that Russia became, for a time, over-capitalised. She laid down more plant, and on a bigger scale, than she could at first use or maintain.

The Soviet Government was also confronted with the peasant problem. The Russian peasant is apt to be intractable. Peasantry who have been attached to the soil for centuries are always difficult people to deal with if you want them to change their ways of life and adapt themselves to new conditions. It was necessary during the operation of the Plan to stimulate the production of grain and other necessities of life, and secure their distribution among industrial workers. To stimulate this production it was found necessary to tolerate a certain amount of private enterprise, which, of course, is contrary to the fundamental tenets of Communism. The Five-year Plan was really State Socialism, which is a different thing from Communism. The evolution of

Russia appears, therefore, to be tending away from Communism towards State Socialism.

In the Second World War, Russia was called upon to bear the full weight of the undivided power of the German military machine. Her successful defence after the first onrush had been checked, and her subsequent brilliant campaign ending in the capture of Berlin, revealed a capacity for organisation and a national unity unsurpassed in the history of the world.

(3) NATIONS GOVERNED AUTOCRATICALLY

Two of the principal nations of the world were governed by Dictators. The systems of government in Germany and Italy were respectively known as the Nazi system and the Fascist system. One other leading nation was governed by autocracy, viz. Japan.

FASCISM

Fascism first reared its head in Italy. Its central theory is that of the corporate state. The object is to concentrate the energy of the whole people upon productive work, and to put an end to the antagonism between Capital and Labour. Every industry is represented by a syndicate of employers and a syndicate of employees. In each industry the syndicates of employers and employees can enter into collective contracts regarding wages and other conditions of labour, the contracts being sanctioned by law. Strikes and lock-outs are illegal.

In Italy the real governing body was the Fascist Grand Council under the presidency of the Premier, in whom the supreme authority resided. It is possible that with a Prime Minister of a different personality from Mussolini, the supreme power would have reverted to the Grand Council. There was also a Senate and a Chamber of Deputies. The Senate was nominated by the King, on the recommendation of the Prime Minister, and, therefore, could be regarded as an independent body. The

Chamber of Deputies was chosen in a manner quite different from that employed in the countries where parliamentary democracy still prevails. In Italy the Chamber consisted of 400 members, elected in the following way: 1,000 names were submitted to the Fascist Grand Council by the syndicates of employers and employees, including a small number put forward by certain professional bodies. Of these the Grand Council selects 400 names which are submitted *en bloc* to the electorate, which votes for or against the whole 400.

The result of this system is that there is no parliamentary opposition. The Fascist view is that the function of the Chamber of Deputies is to discuss, criticise and approve but not to oppose. They take the view that the ordinary voter is quite unfitted to express any opinion on the complicated problems confronting the Government of a modern community. In their view these problems can only be dealt with by experts.

Whilst this system had advantages from the point of view of technical efficiency, it involved the complete suppression of the liberty of thought and action of the individual citizen, and led to corruption on an unprecedented scale.

NAZISM

The Nazi system which arose in Germany corresponded closely to the Fascist. Both Nazis and Fascists described their system as "the Corporate State." By this they meant that the Fascist and Nazi States were united within themselves. They claimed that the interests of all classes and all individual persons were equally served by their organisations. They contended that the interest of each citizen was identical with that of the whole community. They further claimed that the interest of the individual citizen could not be better served than through the syndicates or National Corporations as they call the joint associations of employers or workers in each industry.

They claimed that by this means the actual material interests of citizens were better secured than by the geographical constituencies of the older parliamentary systems.

The Nazis and Fascists also claimed that the predominant problems in the modern world are those connected with commerce, tariffs, currency, finance, education. They further argued that each individual producer is more intimately connected in modern times with people of his own trade or profession all over the world, than he is with other people who may inhabit the same locality. Trains, telegraphs, motor-cars, broadcasting and a world-wide Press have obliterated the obstacle of distance; local industrial conditions are tending to become merged into national or even world conditions; and generally, the old idea of government being based upon the general views of life held by millions of people in their several localities, and not upon their immediate occupational interests, according to the Nazis, was obsolete.

It will be observed that the tendency here is to treat man merely as a producer of goods. The opponents of the Fascist and Nazi régimes contend that all three systems forget that the principal object of the State should be to help each individual man to live out his own life. It is contended that the individual should not be subordinated to the State any more than is absolutely necessary in order to secure safety and the means of existence. In other words, a system which interferes with, and, as in the case of these new States, ignores, the claims of individual personality fails in the discharge of the true functions of the State.

History will probably decide that the collapse of Fascism (including Nazism) was due both to its fundamental unsoundness and to the superior morale and scientific and military prowess of the nations whom it sought to subdue. The secret police, sadism, the suppression of freedom of thought and the consequent disappearance of

creative art, literature, religion and all the elements of culture seem to have been the inevitable results of a Fascist system. It is to be hoped that humanity will not forget the terrible lesson of the years 1918-1945 and remember that the purpose of a civilised community is to create social conditions favourable to the best possible development of the individual human being.

JAPAN

Theoretically, supreme, absolute power rests with the Emperor (Mikado), who is held to be divine (the Son of Heaven), who rules the country through an elected Parliament. In practice the country is ruled by a cabinet selected from the aristocracy. Of recent years this cabinet has been mainly military in character, and bent upon foreign conquest. By means of a secret police, and the control of the army, the Cabinet has wielded power as absolute as that of the Fascist and Nazi Governments of Italy and Germany. With the collapse of the military power of Japan the supreme power has passed into the hands of the American Commander-in-Chief. The future system of government of Japan has yet to be decided.

CHAPTER XVI

THE UNITED STATES OF AMERICA

Prosperity — Slump — The New Deal — Administrative Reform — The Functions of the President — The Civil Service — The Constitution of Great Britain compared with the Constitution of the United States of America.

PROSPERITY

A PERIOD of tremendous prosperity for the United States began with the First World War. The Americans found it possible to sell all their surplus products to Europe at very high prices. Manufacturing industries increased their output. Food producers and munition works went at full speed, and turned out the maximum of which they were capable. Everything that America was capable of producing, and did not require for herself, was sold abroad at high profits. The belligerent powers applied to America for financial help and obtained enormous loans, with the result that practically every American liability in Europe was cancelled and enormous assets substituted. America became the creditor of the world. Practically every important country became a debtor to the United States.

Not only was her financial position immensely improved, but America was able to extend her markets. The Powers engaged in the war were compelled to withdraw their energies from business in many directions, and such markets as the South American, Chinese and Indian were open to American traders. When America entered the war this sudden prosperity received a check, but after it was over, America, which had suffered little compared

with France and England and Germany, resumed her victorious commercial progress.

During the decade following the termination of the war, it is estimated that the wealth of the United States increased to 355 billion dollars, which was about 100% above the pre-war figure. A great rise also took place in wages; and it was estimated that these were actually 150% above the pre-war level, even after taking into account the increase in the cost of living. At the same time the hours of labour were falling and the relations between employers and employees were improving. Workers bought their houses, invested in stock and bonds and bought motor-cars. When a motor-car was still a luxury in Europe, in America there was one motor-car to every four persons.

SLUMP

Then came the crash. Suddenly confidence seemed to disappear. Values of stocks and shares came crashing down. Thousands were ruined. Everywhere business contracted, and between 1930 and 1933 the number of unemployed increased from 6 millions to 12 millions, and for the first time the United States was faced with a colossal deficit in its budget.

The reasons for this tremendous collapse have never been fully ascertained. They are, in fact, still being investigated, but it was probably partly due to production outpacing the capacity of foreign markets to absorb the products and pay for them. Furthermore, America had probably developed a sense of superiority and had not allowed for the recuperative powers of her business rivals, and particularly those of Great Britain, which was destined, within a few years of the great American financial crisis of 1929 to 1933, to resume her position as the leading financial centre and one of the greatest commercial powers in the world.

The economic collapse of America was reflected in the

Presidential Election wherein the Democratic candidate, President Roosevelt, was elected by an enormous majority. Here America lived up to her traditions. She has always shown herself capable of producing the right man at the right time, and the developments since 1933 appear to show that once more she has done this.

THE NEW DEAL

President Roosevelt's name is associated with the *New Deal*, and no doubt always will be. This was a grandiose scheme for the reorganisation of American industry. Its worst enemies are bound to admit that it has met with a considerable measure of success. Anyhow, the fact remains that, since Roosevelt assumed the Presidency, a steady improvement has been taking place in America's industrial and financial position, as well as in the position of the wage-earner.

For the first time the Government of the United States has, under the direction of its President, intervened in industrial affairs. Vast public works were instituted to provide, as far as possible, for the enormous number of workers unemployed. The hours of labour were regulated by the Government and, again for the first time, national schemes of pensions and unemployment and sick pay were introduced. The Government recognised the rights of the workers to collective bargaining. The Trade Unions acquired a new status in the American community, and, after a bitter struggle, the employers, under pressure from the President and his Government, were induced to recognise the status of the Unions.

Then came the great struggle between the President and the Supreme Court, which gave a ruling declaring much of his New Deal to be illegal. The President took up the challenge, and at a new Presidential Election gained the most overwhelming victory ever won by any American President.

The New Deal was a great experiment, and on the whole

succeeded. It necessarily had its failures as well as its successes, but few people are now prepared to deny that it inaugurated a new and better era in American economic and industrial life.

ADMINISTRATIVE REFORM

President Roosevelt challenged the Judiciary of the United States of America. At the same time he tackled the reform of the Executive Branch of the Federal Government. With this end in view the President appointed a Committee on Administrative Management, which made its report. The Committee endorsed the President's view that if democracy is to survive, it must govern efficiently, and in order to accomplish this great changes were necessary in the administrative machinery of the Republic. The following quotation from the report indicates the Committee's attitude:

"Facing one of the most troubled periods in all the troubled history of mankind, we wish to set our affairs in the very best possible order, to make the best use of all our natural resources, and to make good our democratic claims. If America fails, the hopes and dreams of democracy over all the world go down."

THE FUNCTIONS OF THE PRESIDENT

The responsibilities which theoretically devolve on the President are so great that it is impossible for one man to carry them out adequately. He is ceremonial head of the nation, the leader of a political party, the presiding genius of Congress, the Commander-in-Chief of the Army and Navy, and the head of all the Government departments. The President's plan was to delegate these responsibilities to others to carry them out in detail, while he remained in supreme control.

In order to accomplish this he appointed, as part of his staff at the White House, a number of assistants fully

qualified to act as intermediaries between him and the great State departments.

The President retained direct control over the staff of all the Government departments, and over fiscal policy. This control was exercised through the medium of three departments—the Civil Service Commission, the Bureau of the Budget and the National Resources Board, all of which were directly responsible to the President.

THE CIVIL SERVICE

The Civil Service Commission was replaced by a Civil Service Administrator, acting with an unpaid board of seven members appointed by the President.

The Bureau of the Budget was within the Treasury. It was understaffed, insufficiently financed and overwhelmed with routine work. In addition the President decided to set up an adequate "Planning agency." The United States had at that time 47 State Planning Boards, 11,000 City Planning Boards and 400 County Planning Boards. For the country as a whole there was no permanent Planning Board. The President established a National Resources Board which acted as a Central Planning Board and was permanent.

The effect of all this was undoubtedly to increase the power of the Central Government in America. This was a great change in the American point of view. Before the advent of Roosevelt, Americans were suspicious of anything in the nature of a strong Government at Washington, but the terrible social and economic trials they had to face after the great slump have convinced them of the necessity of following the course adopted by the President.

THE CONSTITUTION OF GREAT BRITAIN COMPARED WITH THE CONSTITUTION OF THE UNITED STATES OF AMERICA

BRITISH CONSTITUTION

In the British Constitution sovereignty is vested in "the King in Parliament." When a Bill has been passed by the House of Commons and the House of Lords and receives formal royal assent it becomes law, but not before. It can only be amended or repealed by Parliament itself, which, as above indicated, consists of three elements, viz. the House of Commons, the House of Lords and the King.

The British Constitution is unwritten, i.e. it is not embodied in any one document. It has grown up throughout the ages, and is really a body of custom and tradition.

The American Constitution, on the other hand, is written. It exists in the form of law, and embodies certain maxims establishing principles of social justice. These laws cannot be altered except by the decision of a two-thirds majority in the Senate and the House of Representatives, and a three-quarters majority in every State. It is claimed for a written Constitution such as that in the United States that it makes for stability and prevents revolutionary changes based upon a wave of popular opinion. The chief criticism to be levelled at this Constitution is that it was framed in the eighteenth century, after the War of Independence, and never contemplated the complicated modern industrial State which has now come into being. Its existence has certainly hampered President Roosevelt in his attempt to modify the social and economic structure of America to meet the new developments.

An important difference between the British Constitution and the American is to be found in the relations

between the Government and the Legislature. In England the head of the Government can only carry on as long as he has the support of the majority of the House of Commons. That is to say, there is no fundamental distinction between the legislative and executive factors in the Constitution, the executive being dependent upon the legislative for power to exercise its functions. In America the position is different. The head of the Government is the President, who is elected by the people, quite independently of Congress. His legislative proposals must be passed by Congress before they can become law, and he can veto the legislation of Congress. Furthermore, he holds his position for a definite term of years, and does not in any way depend upon Congress for his tenure thereof. In effect it is difficult for a President to accomplish anything without the support of Congress, but they cannot remove him from his post.

There is in the United States a third Power, that is the Supreme Court, whose function it is to interpret the Constitution. It has no executive powers, but its word as to the validity of legislation is final. Thus the President may prepare new laws, and Congress may pass them, but if the Supreme Court says they are unconstitutional, they are rejected and cannot be enforced through the Courts. This is entirely different from the position in England, where a law which has been passed by Parliament cannot be challenged by any Court, or any authority in the Realm. In England the Courts *interpret* the law and administer justice; they have no power over parliamentary legislation.

CHAPTER XVII

FOREIGN AFFAIRS

The Empire—The Imperial Conference—The British Commonwealth—The Dominions—India—Foreign Affairs—The League of Nations—Mandated Territories—International Co-operation.

THE EMPIRE

IN the summer of 1887, a conference of representatives of the self-governing colonies took place in London. They had come to discuss with the Imperial Government matters of common interest. They had also come to attend the Golden Jubilee of Queen Victoria. This was the first Colonial Conference. Lord Salisbury, in his opening speech, indicated that he foresaw great developments.

THE IMPERIAL CONFERENCE

This Conference, which now takes place periodically, is the direct descendant of the Colonial Conference. Since that time, the self-governing Colonies have become independent self-governing nations. Witness the Preamble to the Statute of Westminster, wherein Great Britain and the self-governing Dominions are declared to be "autonomous communities within the British Empire equal in status, in no way subordinate to one another in any aspect of their domestic or external affairs, though united by a common allegiance to the Crown, and freely associated as Members of the British Commonwealth of Nations."

Lord Salisbury expressed himself against "all ambitious schemes of Constitution making." But he referred to the

Colonial desire for federation as "the nebulous matter which in the course of time would cool down into material and practical results." This has taken place in a much shorter time than Lord Salisbury anticipated.

THE BRITISH COMMONWEALTH

The Constitutional development of the *British Commonwealth* seems to have proceeded side by side with the history of the Monarchy. The various Jubilees and Coronations have been made the occasions for the meeting of Empire statesmen in London. The Conference of 1887 occupied itself mainly with questions of defence, and it was agreed, among other things, that the Australasian squadron should be strengthened by the addition of five fast cruisers and two torpedo gunboats. The Australasian Colonies agreed to pay an annual contribution for ten years towards the maintenance of these ships. The Conference also foreshadowed the Federation of the Australian colonies, and the birth of the Commonwealth of Australia.

In 1897 self-governing colonies sent eleven Prime Ministers to Queen Victoria's Diamond Jubilee, and a second Colonial Conference took place which was presided over by Mr. Joseph Chamberlain. A third Conference took place in 1902 on the occasion of the Coronation of King Edward VII. The last Colonial Conference took place in 1907, when the Imperial Conference was created by the following resolution: "That it will be to the advantage of the Empire if a Conference, to be called the Imperial Conference, is held every four years, at which questions of common interest may be discussed and considered as between His Majesty's Government and His Governments of the self-governing Dominions beyond the Seas."

The first Imperial Conference was held in 1911, the year of the Coronation of King George V.

In many respects the British Empire is unlike any Empire which has existed in the past. It is certainly the biggest, the most widely distributed and the most mixed as regards its constituent elements. It occupies more than one-fifth of the land of the globe. Nearly one-quarter of the population of the world lives within its borders. The whole of one continent is British, and of the other five continents an appreciable portion comes under the Union Jack. In addition to some of the most densely populated regions of the globe, it includes wholly unpopulated areas in the Antarctic region. Its inhabitants include not only millions of white people, but also negroes in Africa, who hunt the lion with spears, Dyak head hunters, Australian aborigines, who are believed to be similar to prehistoric man of a hundred thousand years ago, and millions of Indians. The brown and black population of the Empire exceeds the white, and the non-Christians are much more numerous than the Christians.

Its political organisation is as heterogeneous as the racial. There are the *Self-governing Dominions* and *Colonies*; there are *Crown Colonies*, ruled direct from Whitehall; *Protectorates*; *Native States*, owing a kind of feudal allegiance to the British Crown; *Mandated Territories*; and *Spheres of Influence*.

What is being done throughout this vast organisation towards the advancement of science in its application to human life?

India has a Biological Survey. The Dominions have their own Universities and Agricultural Research Stations. In Africa and elsewhere research work is being done in medicine, agriculture, forestry, geology and veterinary science.

THE DOMINIONS

The Dominions are: The Dominion of Canada, the Commonwealth of Australia, the Dominion of New

Zealand, the Union of South Africa and Eire. Canada has a federal constitution. Its various provinces have their legislatures which are subject to the federal Parliament, which is bi-cameral, i.e., there are two chambers: The Senate and the House of Commons. South Africa is a federal state and has a Senate and House of Assembly. Australia is federal and is governed by House of Representatives and the Senate. New Zealand has a House of Representatives and a Legislative Council. Eire is governed by a Chamber of Deputies (Dáil Eireann) and a Senate (Seanad Eireann). The Statute of Westminster A.D. 1931 provided that Dominion Parliaments would in future be competent to legislate with regard to those matters of Dominion concern which had hitherto been regulated by legislation of the Imperial Parliament. It was also provided that the Dominions could repeal existing Imperial legislation on the same matters, had full power to make laws having extra-territorial operation, and were assured that the legislation of the Parliament of the United Kingdom would only apply to them with their consent. The Dominions are united by the common allegiance to the Crown. The outward symbol of the allegiance is the Governor-General who, in each Dominion (except Eire), represents the King. The Imperial Conference of 1926 decided that the Governor-General would, in future, be the personal representative of the King and not, in any sense, of the British Parliament. The Dominions at the same time acquired the right to be the exclusive advisers of the Crown in the appointment of Governors-General. The Irish Free State in 1936 eliminated the Governor-General from its internal Constitution.

The Governors-General except in the case of New Zealand are no longer the Channel of Communication between the Dominion Government and the Parliament of the United Kingdom. The Channel of Communication was established by the appointment of High Commissioners and Trade Commissioners and Agents-General.

The self-governing character of the Dominions is further emphasised by the fact that Canada, South Africa and Eire have their own Diplomatic Corps, and had established Legations in the principal capital cities of the pre-war world. Canada had legations at Washington, Paris, Tokyo; South Africa at The Hague, Brussels, Rome, Washington, Berlin, Stockholm, Paris, Lisbon; Eire at Washington, the Holy See, Paris, Brussels, Berlin and Madrid.

The white population of the British Commonwealth of Nations is distributed in order of magnitude between Great Britain, Canada, South Africa, Australia, Eire and New Zealand. These were according to the last available figures:

Great Britain . . .	44,937,444
Canada . . .	10,376,786
South Africa . . .	8,600,300
Australia . . .	6,724,305
Eire . . .	3,033,000
New Zealand . . .	1,485,046
Total . . .	<u>75,156,881</u>

It is interesting to compare the geographical area occupied by each of the members of the Commonwealth. It will be noticed that the areas tend to be in inverse ratio to the population. They are as follows:

Great Britain . . .	88,756 square miles
Canada . . .	3,603,910 square miles
South Africa . . .	473,000 square miles
Australia . . .	2,974,581 square miles
Eire . . .	26,609 square miles
New Zealand . . .	102,375 square miles

INDIA AND PAKISTAN

In the year 1947 British India ceased to exist. Its place was taken by the two self-governing Dominions of *India* and *Pakistan*. This division of former British India into two new states is, in effect, its division into a Hindu state (India) and a Musulman state (Pakistan).

Each dominion has a Governor-General who represents the King. Each has its own Parliament, which is in no way subject to the British Parliament at Westminster, and each has its own Army, Air Force and Navy.

The total area of the two Dominions exceeds 1,000,000 square miles, and the population exceeds 320,000,000. Both in area and population India considerably exceeds Pakistan, which occupies the western section of the sub-continent.

The capital of India is *Delhi*, and of Pakistan *Karachi*.

FOREIGN AFFAIRS

No nation and therefore no citizen of any nation can afford to ignore its neighbours. In the modern world no nation can afford to ignore any other nation in any part of the globe.

The events of 1938 in central Europe, where a small nation (Czechoslovakia) was at variance with one of the largest national units in the world (Germany), shook the world from end to end. The repercussions of the Munich settlement were felt almost as much in the Antipodes (Australia and New Zealand) as in London, Paris, Berlin and Rome. The German attack on the Jews rocked the American continent.

Some of the outstanding facts in World Polity during the interval between the two world wars are as follows:

(1) The revival of what was known in pre-1914 Europe

as the "Drang am Osten." This German phrase means "The Drive towards the East." Many students of Foreign Affairs believed that this was the keystone of German policy and lay behind their desire to remove the strategic barrier of Czechoslovakian military power, backed by France and Russia. The objective was said to be the mineral and cereal resources of central and south-eastern Europe.

(2) The revival, in a violent form, of Anti-Semitism in central Europe.

(3) The rise of the new Italian Empire.

(4) The close collaboration of Britain and France in European affairs for some years and the steady decline subsequently of that understanding.

(5) The struggle in Spain between the Government of the Republic and General Franco.

(6) The Trade Agreement between Britain and the U.S.A.

(7) The struggle in the Far East between Japan and China.

(8) The leadership of the whole American continent by the United States of America.

(9) The effect of the known destructiveness of aerial warfare upon the policy of European Governments, and the attitude of the civilian populations towards War.

(10) The great influence upon Public Opinion in the various States of Government-controlled or Government-influenced wireless propaganda.

(11) Racialism and Nationalism.

After the First World War, Nationalism grew apace in Europe and, in its wake, there grew up in Germany the doctrine of Racialism.

A nation is a political and economic unit, and Nationalism tends to make the interests of that unit paramount without regard to the wider interests of humanity. It is a kind of extreme international individualism. Racialism

goes a step farther, and raises a particular human stock above all others in the estimation of the individual members of that stock. So with Aryanism in Germany. A number of Germans claimed to be of a pure racial stock, which they call Aryan. They also claimed that the stock was superior to any other.

The theory which stands against these nationalistic and racial views may be described as "Humanism," which emphasises those factors which unite human beings throughout the world, and seeks to reconcile and not to emphasise differences between nations and races.

THE UNITED NATIONS ORGANISATION

The League of Nations has ceased to exist: The United Nations Organisation came into being in June, 1945, and consisted of those nations who joined in the war against Germany. It is intended eventually to embrace all sovereign nations. It was created on the initiative of the late President Roosevelt. The object of U.N.O., as the organisation is universally called, is to maintain peace, to ensure justice for peoples and individuals. Its permanent, official headquarters are to be in the U.S.A.

The internal organisation of U.N.O. is as follows:

The Security Council. This is the executive governing body. It consists of 11 members, including 5 permanent members, viz. U.S.A., U.S.S.R., Great Britain, France, China. The other 6 members are elected for a 2-year term by the General Assembly.

The General Assembly consists of delegates of all member States. The Economic and Social Council consists of 18 members elected by the General Assembly. The International Court of Justice, consisting of 15 judges, who will decide cases of a non-political and non-economic type, voluntarily submitted to it by member States. The Director-General, who is the Supreme Official of U.N.O.

The Secretariat, which works directly under the Director-General.

The formation of the United Nations Organisation was the sequel to a conference at Dumbarton Oaks, at which U.S.A., U.S.S.R., Great Britain and China, known as the Sponsoring Powers, drew up proposals which were submitted to a conference of the representatives of 50 States at San Francisco.

The first meeting of the General Assembly of U.N.O. took place in London in January, 1946, when Dr. Trygve Lie was elected Director-General. On completion of its deliberations the Organisation moved to America, where the Secretariat is now permanently located and the Security Council is in permanent session.

One of the most important decisions of the General Assembly was to set up the United Nations Educational, Scientific and Cultural Organisation (U.N.E.S.C.O.).

With the object of securing the support of the public for U.N.O., the United Nations Association has been inaugurated in Great Britain.

MANDATED TERRITORIES

In addition to the self-governing Dominions and the Crown Colonies, which are governed direct from Whitehall, the British Commonwealth contains within its borders what are known as Mandated Territories. These are areas which were handed over by the League of Nations, either to Great Britain or to the Dominions, to be held in trust for the League.

The duty of the *Mandatory*, i.e. the nation which undertakes this trusteeship, is to administer these territories for the benefit of the inhabitants, until such time as the latter are ready to assume the administration.

Among the mandated territories administered by Great Britain are Palestine and Mesopotamia. German South-West Africa is administered by the Union of South Africa; and islands in the Pacific are administered by Australia and New Zealand.

INTERNATIONAL CO-OPERATION

The improvement in communications has rendered international co-operation possible in many spheres. We have already referred to some of the activities of the League of Nations in this direction, particularly in the realm of *Health*. We have referred to the dread disease, Diabetes. In this sphere, as well as many others connected with medicines, the *League of Nations* did important work.

Diabetes is due to the tissues being unable to use the sugar circulating in the blood. As already pointed out elsewhere in this book, insulin makes up for this deficiency by enabling the tissues to utilise the sugar. But the problem is not quite so simple as this, because if the insulin is not strong enough the tissues will not take up enough sugar, and the symptoms of diabetes will remain. On the other hand, if the insulin is too strong, the tissues take up too much sugar and the blood is depleted of this essential ingredient with serious results.

It accordingly became necessary to standardise *Insulin*, and much research was necessary before this could be satisfactorily accomplished. The job was first tackled by the British Medical Research Council. Then the Health Organisation of the League of Nations took it up, and started lines of research in many different countries. Thus immense progress was made, and this disease is now kept effectively in check.

International co-operation has also done much in other directions such as the standardisation of diphtheria anti-toxin, salvarsan, arsenicals used in the treatment of sleepy-sickness, and of different types of vitamin.

In spheres other than that of medicine, international co-operation has also accomplished much, and should accomplish more in the future. There is, for instance, the International Tin Research and Development Council and the field of *Meteorology*. International efforts in

connexion with the latter science are, among other things, directed towards the establishment of a short air route between Europe and America.

Much is being done, but not nearly enough as yet, to promote mutual understanding between the nations, by means of interchange of tourists, professorships, school children, scientific students and workers.

There is no doubt that international congresses of scientists, teachers, doctors, lawyers and others all tend to promote international understanding. Even birds are useful in this direction, as evidenced by the frequent meetings between French, German, Dutch and British ornithologists.

Other instances where international co-operation have had valuable results for humanity as a whole are the discovery of insulin, through the co-operation of English, French, German and other scientists, and the co-operation between Hungarian, British, Dutch and American workers on vitamins.

We must not, however, become satisfied. Tremendous as have been the achievements of science during the last century, we are still less enlightened in our attitude towards science and learning generally than were our ancestors a hundred years ago, when, during the Napoleonic Wars, Sir Humphry Davy was allowed to travel to France, and was received in Paris with high honours.

EXAMINATION QUESTIONS

1. Describe the more important differences between the British and the American Constitution, and between the powers of Premier and President.
2. "Self-government is better than good government." Discuss how far this statement applies to contemporary Europe.

3. "There is too much interference on the part of the Government with the pleasures of the people." Do you agree?

4. What are the functions of the judge and the jury in a trial? Point out any merits and defects of the jury system that occur to you.

5. Give a brief account of one of the following movements: Bolshevism, Fascism, Nazism.

6. Is Russia a democracy?

7. Do you think that any changes should be made in the powers of the B.B.C. when the present Charter expires? Give your reasons.

8. Discuss the present position and the prospects of Communism in this country.

9. Discuss, with illustrations, the qualities in a political leader that capture popular imagination.

10. Give some account of the functions of *four* of the following officials:

The Speaker of the House of Commons; The Chancellor of the Exchequer; the Lord Chancellor; The Attorney-General; a County Court Magistrate; a Diocesan Bishop; a Lord Mayor.

11. Is it desirable that the State should undertake the planning of industrial reorganisation?

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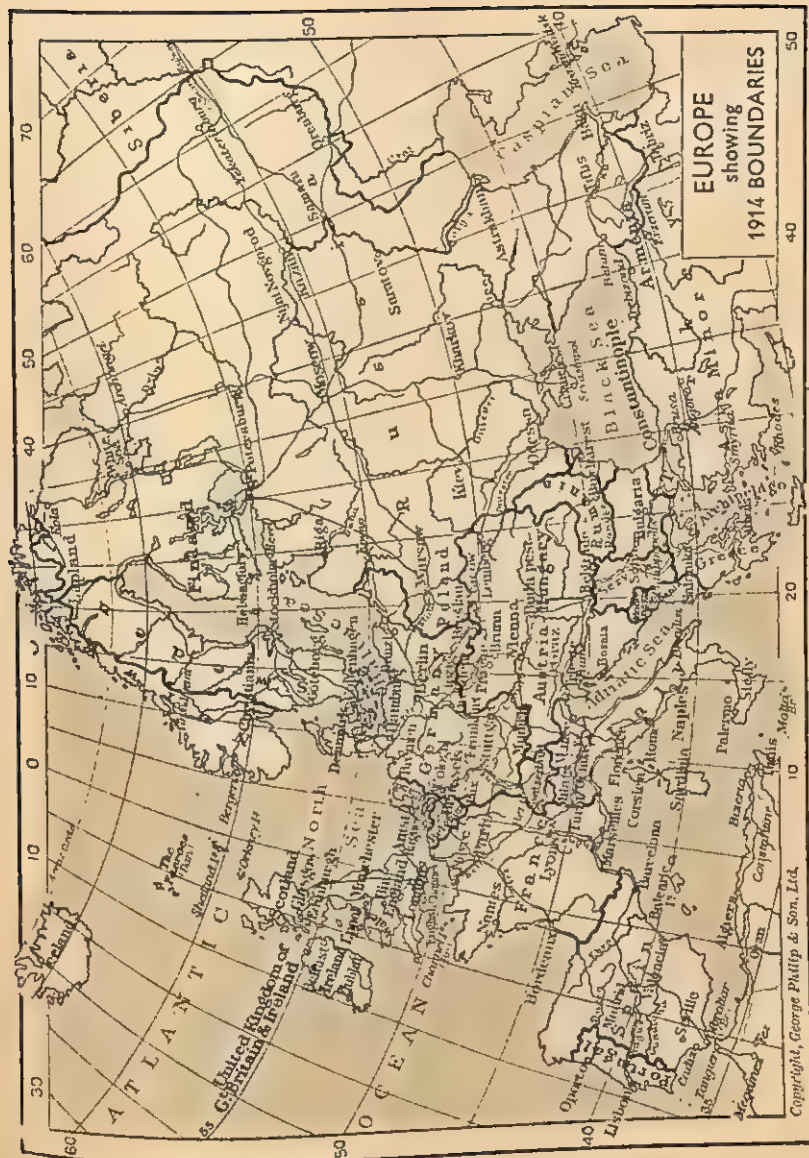
THE following maps illustrate the changes in the map of Europe since 1914.

The student should study them and ascertain for himself what these changes have been and their effect upon the Political Groupings of Europe.

He will note that the areas of sovereignty of some nations were extended, whereas others contracted.

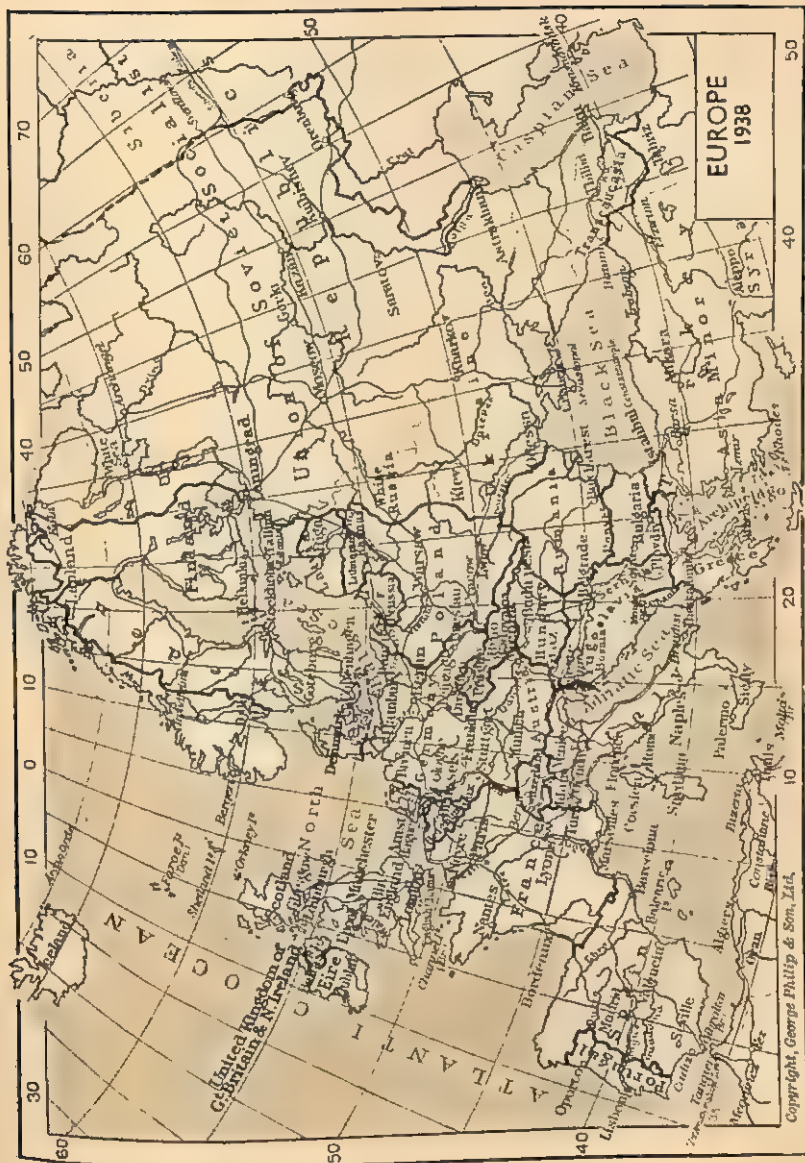
He will also note that in certain areas new nations came into being, exercising sovereign power over areas hitherto coming under other Political Groups.

The third map (1938) should be carefully studied in the light of the Second World War.



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PART IV
SOCIAL LIFE



CHAPTER XVIII

LEISURE IN MODERN CIVILISATION

*The Right Use of Leisure—Employers and Employed—
Sport—Leisure and Occupation—Leisure as "Playtime"—
Ancient Athens—The Spartans—The Romans—Elizabethan
Age—Eighteenth Century—To-day.*

THE RIGHT USE OF LEISURE

IN the civilisations of Europe and America, the problem of the right use of leisure is rapidly becoming as important as the problem of finding suitable employment for their vast population. The advance of Science during the last two centuries has enabled man to produce the necessities of life, and indeed its luxuries, without the exhausting toil of the pre-scientific era. This has produced a progressive tendency to shorten the hours of labour and to increase the time and the energy available for the pursuits of leisure. There is no doubt, if civilisation survives the threats to its existence, that this tendency will be intensified in the future. There is certainly no limit in sight to the potentialities of Science, intelligently applied. It can lighten the lot of mankind and reduce the pressure of the struggle for existence upon the individual. It can enable him to divert his energy to the development of his personality in co-operation with his fellows.

EMPLOYERS AND EMPLOYED

The growing importance of this factor in modern life is being more and more recognised by Governments and large-scale employers of labour. It is necessarily part and

parcel of the problems of industrial and business efficiency. The progress of the modern experimental science of psychology has led to the realisation of the fact that a happy worker is more efficient, and gives a greater output than an unhappy one. Large-scale employers are thus making a practice of providing sports grounds, clubs with dance halls and theatres and other amenities for their employees. They are inclined to look with favour upon employees who become conspicuous through their success in sports or their social accomplishments. Governments, while recognising the importance of this aspect, are also concerned with satisfying those who placed them in office. They are consequently apt to regard the problem from a wider point of view than that of industrial efficiency.

SPORT

Modern Governments encourage national sports, provide recreation grounds and open spaces, museums and art galleries, while in some countries (e.g. France) a Ministry of Fine Arts, a National Theatre and Opera are established by the Government.

The Banks encourage their staffs to play football and cricket. A Tennis Star of world-wide fame and noted for his personal charm is offered a large salary by a great trading corporation. An Airman takes to flying as a leisure pursuit, and blazes out new trails, opening up new trade routes across the world.

A Doctor, a Lawyer, or a Business Man finds that proficiency at cards, billiards, golf, or merely a gift for camaraderie brings in new clients and creates social contacts which may have a far-reaching effect upon his career.

LEISURE AND OCCUPATION

The use to which a man can put his leisure hours is influenced by the nature of the *occupation* he follows. If

his hours are long and his work physically or mentally onerous, he will have little leisure time or energy left. If his hours are moderate, and his work does not involve worry or high nervous tension, he will have a chance of developing his personal tastes. Such occupations as those of a routine Civil Servant, a Bank Official, a Municipal Employee, a School Teacher, have moderate hours. The work is usually of a kind that can be left behind in the office. The proportion of Civil Servants who achieve literary success is or was relatively high. Sir John Lubbock, the scientist, was a banker; and Kenneth Grahame, author of "The Golden Age" and "Wind in Willows," was employed in a bank.

On the other hand, it is rare for a practising Doctor or successful Business Man or Lawyer to achieve success in another sphere unless success in his own profession is achieved early in life. More than one eminent writer living to-day has trained as a Doctor, but has given up practice early in life, or has not practised at all.

Those whose hours are long and whose work tends to be physically, and often nervously, exhausting, such as Miners, Factory Hands, Bus Drivers and Mechanics, naturally choose leisure occupations which do not involve effort. Hence these folk congregate in vast crowds to watch football and cricket matches. The glass of beer, the game of darts, the general camaraderie of the public-house again afford an effortless relief and change from the strain and tedium of their daily work, and the films and the radio perform a similar function.

Similarly, the Shopkeeper, the Shop Assistant, the Hairdresser, the Manicurist and the millions of persons engaged in satisfying the multifarious wants created by our complex Western civilisation with its apparently unlimited capacity for satisfying them, tend to turn for relief, in such leisure time as is left to them, to films, radio, dancing, motoring, cycling, swimming, hiking,

gardening, football pools, crossword puzzles and other activities.

LEISURE AS "PLAYTIME"

Leisure time has been described, and well described, as "playtime." It is the time when men and women play, freed for the time being from the struggle for existence. They do what they enjoy doing, not what they must do in order to keep alive. Two factors have always influenced people in their choice of "play"; their available means and the place where they live. In other words, the *Economic* and *Geographical* features.

In modern times, another powerful factor has come into play: Mass Suggestion. People's use of their leisure time is being organised for profit. The advertiser's command of the psychological weapon of suggestion, the ubiquity of the Press, the immense scope given to pictorial advertising in trains, on hoardings and electrical sky signs and other ways, all tend to prevent the individual thinking out for himself how he wishes to spend his spare time. His holidays and week-ends are attractively mapped out for him by Railways, Shipping Companies, Tourist Agencies and Motoring Associations; his evenings by Film Corporations, Skating Rinks, Dance Halls; his Saturday afternoons by Football Associations in conjunction with the Press. In these ways both the economic and the geographical factors are dealt with. The modern organisers of leisure cater for all pockets and all localities.

There is an *historical aspect* to this organising of men's pleasures for profit. The profusion of entertainment offered, the facility of access to it and the powerful mass-suggestion through advertisement are dominant features of the present age; and yet it is well known that loneliness, boredom and lack of outlet for personality are common complaints. What is the reason for this? For the answer we have to look back 2,500 years.

ANCIENT ATHENS

No people has ever equalled the *Ancient Athenians* of the citizen class in the art of using leisure time to the best possible advantage. We have much to learn from them. Few citizens of Athens, though not of course the large class of slaves, during her peak days could have felt that loneliness, that boredom, that lack of outlet for personality which are so common in our great cities to-day. Athletics, Drama, Dancing, Literature, Sculpture, Painting, Architecture and Religion were at the Athenian's door just as they are at ours, but they were woven into the pattern of his life. They came to him as part of the normal routine. They were given to him by rich citizens, not sold to him for profit as is done to-day, to provide an anodyne to his weariness and nostalgia.

Why was this? The Athenians enjoyed one immense advantage over us. Their city-states were small, and each citizen could play a personal and individual part in all communal activities. To them their city was a tangible, personal thing, not a huge agglomeration. They would meet in the market-place and discuss with each other everything under the sun. We modern Britons look upon each other, if we have not been introduced, with cold suspicion. Not so the citizens of Athens. They were citizens of Athens, and because they were a small upper caste, that was good enough for them. As a result they mixed freely, and easily grouped themselves together in common pursuits in their leisure time. Our nearest approach to them is a football crowd, when everyone loses for a time the feeling of isolation in a common enthusiasm for the game. It is noticeable how the barriers of convention are temporarily broken down on these occasions.

The Athenians had a natural genius for living. They did not have to be organised from without. They just spontaneously worked together in the pursuit of the best things life had to offer.

Such was Athens when, to quote the beautiful concluding words of Gilbert Murray's "History of Greek Literature":

"The morning was before her and her wings were strong."

THE SPARTANS

The *Spartan* conception was very different from the Athenian, and approximated more closely to the modern Nazi and Fascist ideal. Leisure activities were entirely subordinated to the interest of the State, with the inevitable suppression of individuality and lack of stimulus to the finest creative efforts of the Human Spirit. The Parthenon, the marvellous sculptures, the supreme literature, the religion and the free creative life of the Athenian citizen could never have existed under such a régime.

THE ROMANS

The rulers of *Rome* found it expedient to organise vast gladiatorial contests and other displays for the benefit of the populace of the capital of the Empire. It was held to be wise policy both to feed the people and give them something to occupy their leisure hours. This policy was summed up in the famous words, "*Panem et Circenses*"—"Bread and Circuses." It has been suggested that there is a parallel to-day in unemployment benefit and football matches. This is a matter of opinion.

In the heyday of the *Middle Ages*, tournaments, pageants, religious processions and plays, folk dancing, music, cock-fighting and other rude sports played a large part in the life of all classes of people. Chaucer wrote his "*Canterbury Tales*" when mediæval civilisation in England was at its height. We have here a clear picture of the joyous ways of living which at least some of the people of these times filled their leisure hours.

ELIZABETHAN AGE

In the next great creative period of English history, the *Elizabethan*, the same applies. The joyous vitality of a

nation which had come to realise its power and was reaching out and grasping a new and wider life found expression in drama, pageantry and adventure which led them to the uttermost ends of the earth. It was not only the lust of power, or the hatred of Spain, which sent Englishmen all over the world. It was undoubtedly also the spirit of adventure, the spirit which sends enterprising boys bird-nesting and getting themselves into all kinds of scrapes, and by courage and initiative extricating themselves.

EIGHTEENTH CENTURY

Two hundred years later came the so-called *Augustan* age in England. During the eighteenth century, England was ruled by a liberal aristocracy. It was the period of "stately homes of England." It was also a period of internal peace and plenty. The people lived secure within their "wooden walls," as they called the "King's Navy," and the pursuits of leisure flourished in all directions. Sport, dancing, pageantry, the theatre and the arts were freely patronised. Science and philosophy progressed. The people were sheltered and on the whole prosperous. Culture and enlightenment were favoured by the ruling class, who had learnt, by the bitter experience of their forefathers, that the British people will not tolerate rulers who attempt to interfere with the citizen's right to live his own life.

TO-DAY

All this was broken up by the industrial revolution which, in the course of a century and a half, altered the face of Western Europe and brought into being the factory, the workshop, the monster store and the vast network of mechanical transport. The workers were marshalled into powerful trade unions, and the employers into corporations with world-wide ramifications and power far exceeding that of the eighteenth-century land-owning

aristocrat. So to-day, in running our lives, we find ourselves faced with very different problems from those which confronted our forefathers, and these problems are fraught with new dangers and unprecedented complexities, but also with great opportunities and greatly increased facilities for the broadening of culture.

CHAPTER XIX

PROBLEMS OF LEISURE

Personality—Social Organisation—Entertainment—The Proper Use of Leisure—Society and Leisure—The Problems of Adult Life—Leisure under Fascism—Leisure in Britain — Books — National Games — International Entertainment.

PERSONALITY

WHAT are these problems, and what are these dangers? The problems arise from the fact that it is the duty of us to develop to the utmost the best potentialities of our personality; the dangers from the fact that the modern tendency to organise is apt to stifle those potentialities, and without them no true progress is possible. Progress, if it means anything at all, means development towards a state where personality has the greatest possible freedom to develop with due regard to the freedom of others.

SOCIAL ORGANISATION

We have to face the fact that organisation on a vast scale has come to stay. Our present complex civilisation cannot be run without it, and the problem is how to combine with it that personal freedom without which no real progress is possible. We know, from our experience in Europe, that a country can be so organised as to suppress all individual freedom, whether of thought or action, so that a universal genius like Einstein must be exiled; a world poet like Goethe becomes ostracised; queer false notions such as the belief that the Germans are of pure Nordic stock are forced into people's minds.

And yet some kind of close-knit organisation was neces-

sary to pull Germany out of the social and economic chaos into which she was sinking, just as it was necessary in Russia and Italy after the end of the First World War. Germany and Italy chose the wrong kind of organisation.

The organisation of our industries is essential to their efficient working. We must look forward to a growth of international economic organisation if the fruits of the earth and the bounty of nature are to be placed at the disposal of mankind. It is not real progress, however, if this organising is extended to dominate our leisure. Such a process carried to its logical conclusion has been brilliantly satirised by Aldous Huxley in "Brave New World."

But the fact remains that there are far too many lonely people to-day, and far too many personalities stunted by isolation. Organisation is therefore needed, but only to the extent of bringing people together, enabling them to meet kindred spirits, and making it easy for them to make an "all-round" use of their leisure.

ENTERTAINMENT

It has been pointed out in the last chapter that a profusion and variety of entertainment is offered, to suit all persons and all pockets. But it will be observed that the bulk of these entertainments are mainly directed to the satisfaction of the senses, rarely of the mind. Many of them are excellent in their way, and frequently beautiful, but entertainment of the mind is rarely profitable as a commercial venture, so it plays a very small part in the profusion of good things served up to John Citizen in his leisure time. It is John Citizen's business to see that he gets more food for his mind than he is now getting, and that it suits his taste. The possibility of all these things exists in our modern community, but it is still embryonic.

THE PROPER USE OF LEISURE

What is the proper use of leisure time? Undoubtedly it is cultivation of the senses, the intelligence and the feel-

ings, with due regard to the claims of each. And what do we mean by this? We have eyes to see with, ears to hear, fingers to touch, noses to smell and palates to taste. These are the senses. What our senses reveal to us our intelligence and our feelings interpret.

We must never forget that it is the senses which provide the intelligence with its material, and the feelings with their stimulus. We cannot therefore afford to neglect the eye, the hand and the other organs of sense, else we impoverish the mind and the feelings.

Nor can we afford to restrict ourselves to the activities of eye and hand, or we shall let the mind grow sick through apathy and lack of exercise, and starve the feelings by depriving them of the wide field of experience with which the intelligent use of the senses enriches them.

What we should do with our leisure time, then, is to use it in such a way as to give its due meed of activity to each of these three parts of our nature, to so balance our activities that each shall have its proper share.

Let us observe things, handle things, but also let us *interpret* things and feel rightly about them.

The doctors tell us health is a question of perfect *metabolism*, that is, a balancing of the right functioning of the organs of the body.

So there is a metabolism of personality. A balancing of those activities which make up personality and character. *Our leisure should be used in such a way as to achieve that metabolism.*

SOCIETY AND LEISURE

Now this is essentially a problem for each individual, but civilisation and society can make it easier for the individual to achieve it by facilitating the contact between individuals and removing obstacles to that contact, and by placing within the reach of all the experience and wisdom accumulated by mankind throughout the ages and being accumulated to-day.

Now what are we doing to-day in this direction, and how can we improve upon what we are doing ?

THE PROBLEMS OF ADULT LIFE

When boys and girls leave school, they are more often than not plunged at once into the business of earning their living, and preparing for their vocations. They tend to drift away from the organised leisure activities which are part and parcel of their school life. What is offered to them in the place of these ?

The small minority who go to a University find ample provision in University life for their leisure hours.

Some of the others join tennis clubs, football clubs, cricket clubs, or dramatic societies. Others have to continue their studies in evening classes, and perhaps spend their week-ends "hiking," cycling, motor-cycling, motoring, rink skating in the winter and swimming in the summer; while ballroom dancing has become universally popular among people of all ages.

As indicated earlier in the last chapter, they are offered a wealth of spectacular displays in the way of football matches, cricket matches, tennis tournaments, films, theatrical revues, circuses, horse-races, greyhound races, dirt-track races, etc.

It will be observed that the keynote of all this is amusement. It tickles the feelings and emotions. It provides a welcome contrast to the routine of daily life. It is none the worse for that. On the contrary it is useful. But wherein does it fall short of what is needed ? Wherein does it differ from what is provided during school life ?

In a good school certain ideals are constantly kept in front of the boys and girls. The honour of the House, the higher honour of the School, the example of the masters and senior scholars, the value of learning, the importance of the quest for truth, ideals of conduct, deportment, service, all these are kept constantly in mind.

When they leave school all this suddenly stops. They

are "free" of it all, and many begin to revel in their so-called freedom, plunging into the round of pleasures. After a while some of them find that this palls, and this is when the gap in adult life appears.

They look around for something to take the place of the well-organised community they have left (the school), and what do they find? Sometimes a Church with an inspired pastor will fill the gap. Others will attend tutorial classes under the Workers' Educational Association, or attend University Extension Lectures, or join a Polytechnic. But nowhere, excepting perhaps with the inspired pastor, will they find that constant interest in their welfare, that help in facing the problems of life, which they need.

In the school, in the University, the student feels that he is co-operating with his fellows for the benefit of a community he loves, and to achieve ideals of beauty and truth and goodness. He can obtain information from lectures and books, but little guidance on the conduct and ordering of his life.

LEISURE UNDER FASCISM *

In the totalitarian States of Nazi Germany and Fascist Italy, the conception prevailed that the individual should be entirely subordinated to the State. This necessarily involved the State dictating, or at any rate strictly limiting, the use to be made by the individual of his leisure. This is in direct opposition to the governing ideas of our own Democracy, where the conception still prevails that the function of the State is to assist the individual in arriving at the fullest expression of his personality. A great extension of State interference with private lives has inevitably accompanied the increasing complexity of the economic structure of society, but the underlying purpose is still the same. This applies to France, Great Britain, U.S.A., Switzerland, Belgium and the Scandinavian countries. The dangerous conception

of the State as a mystical entity *above* the individual has its advocates, but has made little headway.

In *Germany* and *Italy*, countries that were ruined by the First World War, when the life of the individual citizen became well-nigh intolerable through economic distress and social disorder, the idea of the State offered a hope of improvement in their condition. Some considerable improvement in the standard of living was effected, and the citizen found it better to submit to a control of all his actions, thoughts and feelings, than to the economic misery which prevailed.

The result is that his leisure actions and even thoughts were subordinated to the will of the prevailing Government.

The mystical State is, of course, an abstraction, and the reality underlying it is the will of the Dictator and his colleagues.

LEISURE IN BRITAIN

In *Britain* the opportunities for personal development are not appreciably restricted by Government interference. On the contrary, the Government does much to help. The obstacles are not from that source, but are rather due to the rapid growth of the large cities, and, as already pointed out, the failure to continue in adult life, in a co-operative spirit, the organisation which rules at school. The opportunities for using leisure time towards the development of mind and character are none the less considerable, if only people will use them.

What are these opportunities? Let us consider again the three avenues along which the development of personality must proceed: Sense, Intelligence, Feeling. We must not forget that the movement along these avenues must be in the same direction, frequently converging and uniting. The avenues must converge into "roundabouts," and then diverge and converge again.

Let us consider what are the opportunities at our disposal in the Capital of the Empire. We will suppose

ourselves to be planning what to do during the week-end. We have Saturday afternoon and the whole of Sunday to be provided for.

First of all, if we are sensible and fortunate we will find a congenial companion. Then we will consider what London has to offer us. Perhaps we shall decide to spend the afternoon pleasantly cultivating our minds, and in the evening relax into amusement.

We can see some of the most beautiful things created by the hand and mind of men by going to the National Gallery, and if we choose our time, we can find a lecturer there, who will show us how to appreciate the pictures. The pleasures of our life can be immeasurably increased if we will learn how to look at pictures. Wandering aimlessly round an art gallery is an exhausting and unsatisfactory business, but to spend a couple of hours with a few pictures, and someone who can tell us what to look for in them, is highly satisfactory. Our London is full of these opportunities. On another occasion we could visit the Tate Gallery, and see the modern pictures and sculpture; and again there is the Wallace Collection, with its pictures, furniture and pottery. Again, there are the British Museum, with its library and its collection of antiquities, the Victoria and Albert Museum, with its specimens of Art of all kinds from furniture to sculpture and the Natural History Museum, with its stuffed elephants and tigers and its wonderful collection of precious stones.

Then there is the architecture of London, from the Tower of London, with its Roman and Norman architecture ranging over nearly 2,000 years, through Wren's St. Paul's, and the many other instances of his art, to the modern Shell-Mex building on the Embankment.

If we feel in a different mood there are always the football matches, where we can join in the enthusiasm of the crowd and watch what is often a fine display of craftsmanship.

The eye and the ear will be catered for at Sadlers Wells and the Old Vic., and the sense of fun and drama at the theatres. And there are always the Dance Halls, and the innumerable games such as billiards, table tennis and badminton.

The opportunities of profitably using our leisure are infinite in London and in most provincial cities and towns; so prolific, in fact, that unless we use them systematically and intelligently, they are apt to be bewildering.

What shall we do on the Sunday? Here again the varied countryside around London affords great variety. We can motor, cycle or go by train, and walk into the Surrey Hills, the Kentish garden of England or the Chilterns.

We can cultivate our historic sense (so important to the broadening of the mind) by visiting old churches and ancient villages and country houses. Here it is that we realise the benefit of living in an ancient country undisturbed by foreign invasion. We can see with our own eyes the stones and tiles the Romans used, and that straight thrusting track across the downs where the Roman road once was.

Here and there the church towers, doors and windows of the Saxons remain, and the majestic structures of the Normans are still to be found in many places. The semi-circular arch of the Norman doorway and window merges into the pointed arch of the Gothic Early English, and we see before our very eyes the moulded stones handled by the skilled craftsmen of the heyday of the Mediæval Civilisation. In the same church we may see Elizabethan windows with their thrusting perpendicular mullions. Near by there may be a beautiful Elizabethan Manor House. We have been travelling down the arches of the years until we have reached those days when our present civilisation was born and the foundation laid of our far-flung Empire.

And so to tea in a neighbouring inn, our minds cleared of all petty preoccupations and worries, and ourselves and our lives seen against their true background: the pageant of the Ages.

These ways of utilising our leisure are not confined to London. They are accessible to every citizen of the United Kingdom.

Whilst nations have many ways in common of amusing themselves, differences of national temperament are often expressed in games and other leisure pastimes.

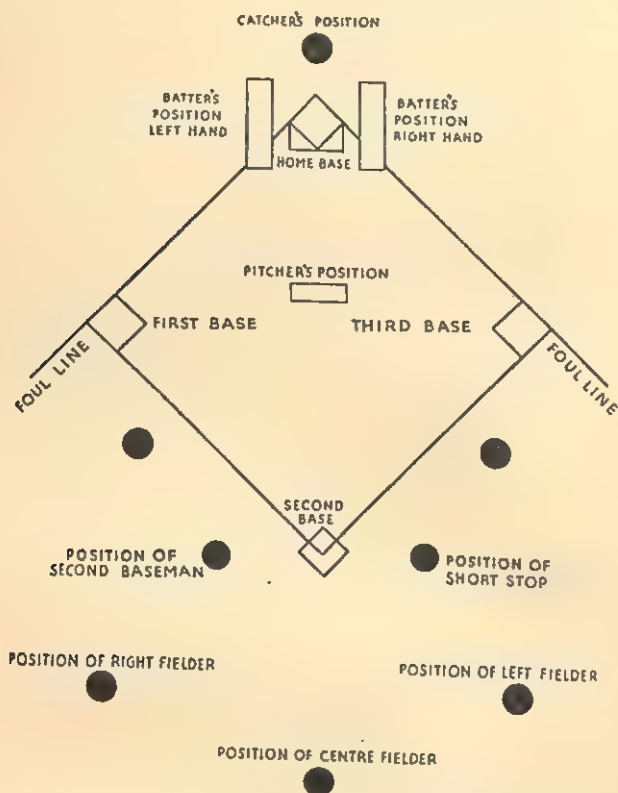
BOOKS

We have, above, referred to the importance of a congenial companion. To those who wish to develop their interest in the world and turn away from the petty preoccupation of self, there are few better companions than a good book. Here once more we find a great boon conferred on us by the Libraries, particularly the Public Libraries, with their warm and comfortable Reading Rooms. There are few more delightful ways of occupying an hour or two of leisure-time than wandering along the shelves of a Public Library and looking into book after book. And this all the more delightful and instructive if you have first of all equipped yourself with a fairly systematic bird's-eye view of the outlines of general knowledge.

NATIONAL GAMES

Cricket is considered to be a peculiarly *English* game. It has not indeed "caught on" anywhere outside the Anglo-Saxon parts of the Empire. The French consider that here the phlegmatic side of the English temperament shows itself. By comparison with other games, it is slow and leisurely. It is essentially a "gentlemanly" game. The word "gentleman" is a peculiarly English product.

Fair play, however, dignity, deportment and chivalry towards the defeated—all these things are brought into play in the fame of cricket. Whatever may be our



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Plan of a Baseball Field.

practice in other matters—and it undoubtedly varies—these qualities have always been proclaimed as outstanding English characteristics.

Baseball, the *American* national game, has been com-

pared by a British spectator to a World War. The fighting spirit of the Pioneers, the ebullient vitality of a young nation, finds expression in this terrifically energetic and really violent game.

One of the chief modern national sports in *France* is lawn tennis. Here again we see the national temperament reflected. Agility, rapidity of movement, dash, quickness of wit, co-ordination of hand and brain—all these qualities, which are necessary to success in the game, are also French national characteristics.

Bullfighting is generally accepted as the characteristic *Spanish* national sport, and here we probably have a survival of the old Roman propensity towards spectacular displays of combat and bravery in the arena.

The other nations of Europe are, as nations, of recent origin and generally derive their national sports by imitation of the older peoples.

INTERNATIONAL ENTERTAINMENT

An *international* form of entertainment common to all nations at all times is the travelling circus. This responds to our national curiosity about the unfamiliar and to atavistic impulses dating back to the times when our ancestors lived in close contact with the denizens of the wild. The same may probably be said of hunting, and possibly of horse-racing, although horse-racing also appeals to the gambling and competitive spirits, both of which are common to the people of most nations.

Many people hold that too much attention is paid to sport in England to-day. It is argued that the tendency to value a man by his sporting achievements does not bring the best types of men to the front; that proficiency at cricket, football, tennis or golf is a form of specialisation which does not imply any capacity for facing the major problems of life. This, of course, is true. Clearly the happy medium is needed here, and we are once more

confronted with the Greek Ideal which gives sport its proper place in an harmonious national life.

The discussion of the problem of leisure is capable of almost indefinite extension. It is, indeed, in some respects the most important of all problems, because it deals with our capacity to enjoy to the full the best things life has to offer us.

CHAPTER XX

EDUCATION

The Object of Education—Secondary Education—The Importance of the "First-rate"—The Need for Example—The Mental and Moral Factor—Physical Education—Games—Homework—The Raising of the School Age—Libraries.

IN this chapter the writer has not attempted any detailed analysis or survey of the facts, but has confined himself to the discussion of some of the problems exercising the minds of educationists at the present time.

The examiners encourage candidates to form their own opinions, and questions are framed with a view to finding out whether the student has done any intelligent thinking of his own.

For material on which to base a more detailed study of the subject, the reader is referred to the Bibliography at the end of Part IV.

THE OBJECT OF EDUCATION

What is the principal object of *Education*? This is not an easy question to answer, so much depends upon the angle from which you look at it. Some will hold that its main purpose is to fit the children for some occupation which will enable them to earn their living; others, that the chief object should be to make them into good citizens; others, that the chief aim should be to develop personality. Here again will be a division of opinion. On the one hand, it will be held that the emphasis in personal development should be the development of the moral character; on the other, that the mind should be the

principal concern; while a third view would be that the two should go hand-in-hand.

One thing is clear, viz. that it is the educator's duty to help the child to grow up in such a manner as will enable him to fit into his environment, and to get the best possible value out of life.

When education is undertaken by the State, as it is nowadays on such a large scale, the problem becomes more difficult and complicated than ever. The Ministers of the Crown, and the Civil Servants, whose business it is to administer national education, have to seek some kind of common denominator. They have to do this by a process of elimination, leaving out of account points of view which are peculiar to individuals or groups of individuals, and taking into account only those opinions which are generally held, or at any rate are held by the majority.

The first thing to fix firmly in our minds when dealing with the subject of education is the fact that it has to deal with two worlds. There is the world outside us and the world inside us: the material world and the world of our thoughts and feelings.

In terms of education this may be expressed as the world of physical science, and the world of psychological science, and of literature, art, religion, history and philosophy. We have also to remember that the educated person must be equipped to earn a living.

Education in England is governed by the Education Acts and administered by the local authorities under the general supervision of the Board of Education. A survey of the whole system will be found in the Hadow Report referred to in the Bibliography at the end of Part IV. It should be possible for the student to obtain access to this report at his Public Library. The student should also obtain and study the Government Paper on the Education Act published by the Stationery Office.

Under the Education Acts, Education is divided into two main classes, viz. elementary and secondary.

Elementary Education includes the training of infants and children up to the school-leaving age. The whole system is still in process of evolution, and in many of its aspects a theatre for controversy between experts. These controversies not only cover the educational organisation, but also the methods of teaching.

SECONDARY EDUCATION

The tendency in secondary education is to leave the occupational aspect out of account on the ground that the special knowledge required for most occupations is usually most effectively learnt whilst the occupation itself is being followed, and in all occupations the more intelligent the employee the better.

Secondary education ends before the student attains to maturity. If a complete view were taken of the development of individual personality, mentally, morally and spiritually, education would be continued throughout the whole of his or her life.

One of the dangers is to attempt too much. A little learning is a dangerous thing. A smattering of a large number of subjects may be interesting, and may produce a person who can be entertaining in general conversation, but such people are superficial and, speaking strictly, ill-educated. One of the greatest sages of antiquity pointed out that the more he knew the less he felt he knew. Unless you go deeply into at least one subject you do not realise how wide, how unlimited, is the field of knowledge. You are apt to think that with a few shallow generalisations you have probed a branch of knowledge to its depths.

Well-educated people are never arrogant. Those with a smattering of everything are frequently conceited. The aim should therefore be to equip the student with a really deep and extensive knowledge of one or two subjects, with a general grasp of the place in the body of knowledge

held by other subjects. You have not been well-educated if you think that you know everything that is worth knowing.

THE IMPORTANCE OF THE "FIRST-RATE"

Life is too short for us to have time to concern ourselves with what is second-rate in the subjects dealt with by education. There simply is not time to grope about among the mediocrities of literature, painting, music and science. One should endeavour as far as possible to seek the first-rate among human beings with whom one has to associate. The difficulty here, however, is to decide what constitutes a first-rate human being. But if education is conducted along the right lines we should be equipped also in this direction. The teachers in the schools, and the professors in the universities, and the employers and senior members of the staff in business organisations, have a great opportunity of setting an example to the younger people who work under them.

THE NEED FOR EXAMPLE

Young people need an ideal to look up to and imitate. They need, as has been said by one of our leading thinkers to-day, a "vision of greatness." It is a bad thing to be launched on the world with a notion that you are as good as everybody else, and that there are no better people in the world than yourself. If so, you have nothing to look up to, no example to follow, no vision of something greater and better than yourself. Without this vision you have no standard to work upon in improving your own character and personality. Surely, during the whole of our lives we should be endeavouring to improve ourselves.

THE MENTAL AND MORAL FACTOR

Here we encounter what appears at first sight to be a dilemma. It has been the practice in the past for middle-aged and old people to regard themselves as much

wiser and better than young people. They have, in their own opinion, obtained the wisdom of maturity and experience, and are sometimes anxious to impress this upon the young people. Now, middle-aged and old people are rarely wise in the deepest sense of the word, and only experienced in a very narrow sense, excepting in those rare instances where they have been fortunate enough or wise enough to secure an education of mind, body and character, such as we have indicated above.

The young people, on the other hand, when they come out into the world look around, or ought to if they have been properly taught, for older people whom they may admire. What do they find? Older and middle-aged people who are assuming an attitude of wisdom and experience, which the young ones soon find out is not borne out by the facts, either of their mental or of their moral equipment. There follows a tendency to disappointment and disillusionment on the part of the young.

It follows from these considerations that our problem is by no means an easy one. We really cannot blame the middle-aged and old people to whom we have just referred, because they probably lacked the advantages of a good education such as is necessary to produce wisdom. This brings us back to the whole educational system itself. Clearly we must aim at giving the young people the best possible foundation, while they are still at school. We should also do our best to provide them with the means of keeping in touch, after they leave school, with what is best in the world of science, literature, art and human personality.

PHYSICAL EDUCATION

Intellectual and moral education is carried on side by side with physical education. From the moment we come into the world we begin a series of physical exercises. We ourselves, as babies, unconsciously practise the art of physical training far more effectively than we do as

adults. As new-born infants we behave as though we had thoroughly mastered this difficult science and delicate art.

This is what the baby, kicking about in its cradle, really means. The infant is developing its physical ability, its intelligence and its will-power all at the same time. It is establishing co-ordination between its muscles and its brain. It is toning up its muscles and charging them with energy, which then proceeds to stimulate its mind. It is keeping up a constant reaction between its muscular system and its mind. The infant begins by moving the smaller joints, its fingers, its toes, its hands and its feet. When it is old enough it proceeds to use its bigger joints. Then it starts tossing about and moving its whole body. This is the meaning of the amusing contortions.

While this is going on the baby is using his eyes. He is distinguishing objects in which his mind becomes interested. Henceforward, he begins to direct his movements towards things he can see. Purpose appears. He begins to handle things. His sense of touch begins to develop, and he begins to perceive distance. All this tends to stimulate his mind and to increase his curiosity. He begins to develop a multiplicity of purposes, his will becomes active, and at last he becomes conscious of his own aims.

In due course, the child's movements become so vigorous that he emerges from his cradle and starts exploring. First of all on all fours, then, standing up and clinging to things, and then walking in imitation of the grown-up people he sees around him. At last, as a result of his instinctive course of physical training, he is able to stand up and walk, and has thus achieved his first great success in life.

Now that he is able to use his legs for supporting his body, his arms are free to do other work. He starts gripping things, his thumb comes into action. The thumb is the principal instrument in manual dexterity. The use of the hand has a great effect on the development

of intelligence, which now, accordingly, begins to grow rapidly.

There is an interesting parallel between this development of the infant and the evolution of mankind from its origin in the primeval ocean, wherein were first developed those movements which were necessary to carry the body on dry land. Then in the forests came the growth of the power of the hand to grip, the arm to lift. Next the ancestors of the human race learnt to handle and move things. Manual dexterity was developed, the rapid growth of intelligence followed and the rudiments of social life appeared.

It will be clear from the foregoing that it is neither possible nor desirable to dissociate physical from mental development. In devising schemes for physical education we should remember that our exercises influence the mind as well as the body, to promote, in fact, the interaction of the two.

GAMES

We lay great stress in this country upon what is called "playing the game." There is, no doubt, a deep significance behind this. Games of all kinds, and particularly outdoor games, have always been popular with the British people. Games are a form of exercise which, by their nature, compel co-operation between the mind and the body. There is every reason to suppose that this tendency in the British character has a good deal to do with the nation's world-wide success.

It is well known that games provide a great relief from mental and nervous strain. This fact in itself is a clear proof of the close interaction between mind and muscle. An outstanding example of this comes from the World Wars. The strain imposed by the terrible bombardments, and by the long gruelling campaigns upon men accustomed to all the comforts of modern civilised life, was tremendous. The British troops employed every pos-

sible moment of leisure in the playing of games. This was wisely encouraged by the authorities, and undoubtedly proved a great relief from the strain of the battle-fronts, and greatly increased the endurance and efficiency of the troops.

The moral of all this is that daily bodily exercise is of the greatest importance, but that it should be pleasurable and interesting, and calculated to develop the mind, the will and the character.

Education is so vast a subject that in no one publication, much less one chapter of a book, would it be possible to cover the whole field. There are, however, certain aspects with which candidates must be familiar. The subjects dealt with in the following paragraphs come under this category.

THE ADVANTAGES AND DISADVANTAGES OF HOMEWORK

This has been held to be of sufficient importance to merit a debate in Parliament, which was followed by a protracted enquiry by experts extending over three years. The enquiry elicited the fact that more homework is given in urban than in rural districts, in prosperous areas than in distressed areas.

The official view appears to be that the chief advantage of homework is the development of self-reliance and initiative, because the pupil has to face, unaided, problems suited to his abilities, or to follow up in his own way the subject in which he is interested. Another advantage is held to be that the pupil has to settle down to his work, and exercise self-control by resisting the temptation to go and amuse himself. This, of course, applies only to "homework" done at home. If it is done at school with a teacher close by, there is neither the stimulus to self-reliance, nor to self-control.

One of the chief aims of secondary education is to help the pupil to so develop his interests and aptitude that he

may be able after leaving school to develop them through his own initiative. The value of homework is seen here; it helps the pupil to realise that the environment in school is not the only one in which he can improve his knowledge.

Some of the alleged defects in secondary education, as it is practised to-day, may be summarised as follows: (1) In many schools effective machinery has not been set up to secure adequate control by the teaching staff. In consequence frequently unsuitable tasks are set for homework, and the time allocated is excessive. (2) Insufficient regard to the individual aptitude and requirements of students, which frequently results in either too long or too short a period of years being allocated to the completion of the school course. (3) Failure to secure the co-operation of parents. (4) Unsuitable home conditions.

THE RAISING OF THE SCHOOL AGE

From the point of view of education the advantages are obvious, and hardly need pointing out. On the other hand, under existing conditions the keeping of children at home undoubtedly places a heavy burden on the parents. At times unemployment has been extremely acute among young people who have just left school. Obviously, keeping children at school for a longer period is going to help to reduce unemployment. Added to which, when the children do come on to the market they will have had the benefit of an extra period of mental and physical training.

Linked with this problem is the problem of adult education, i.e. the education of people after they leave school, who are not proceeding to the University, and have no means of continuing their education in any other way. This problem has hitherto received little attention from the Central Government, although sympathetic, and sometimes practical, assistance has been given, as for

instance to the University extension movement and the Workers' Educational Association.

LIBRARIES

The part played by Libraries in education, especially in post-school, adolescent and adult education, is of the greatest importance. To many a man and woman the Public Library has taken the place of the University of which they could not afford to avail themselves, and the National Central Library and Regional Bureaux have done valuable work by distributing books throughout Great Britain, and exchanging them with other countries.

CHAPTER XXI

SOCIAL CONDITIONS TO-DAY AND YESTERDAY

Social Progress—The Factory Act of 1833—Agricultural Riots—Government's Attitude To-day and Then—Health and Hygiene—Treatment of Disease—Artificial Light—Housing and Recreation—Petrol—Temperance—Thrift—Youth Organisations—Special Areas—Crime.

SOCIAL PROGRESS

IT is undeniable that there has been definite social progress in England during the last hundred years. A hundred years ago, the State took practically no interest in the nation's health. It did not concern itself in any way with sanitation, and only spent about £20,000 a year on education. Our ancestors of this period knew considerably less about drainage than the ancient Romans. It is on record that the Emperor Augustus appointed an official to arrange for the sewers of Rome to be cleared out, and we have details of quite an elaborate system of hygienic drainage at that time.

A century ago industrial revolution was converting England from a country mainly agricultural into one predominantly manufacturing. England was the workshop of the world. Since the beginning of the reign of George III the population had doubled. People were pouring into the towns of the Black Country and the northern industrial areas, where they lived in conditions of almost indescribable misery.

Great Britain was at great pains to put an end to the slave trade, but was blandly indifferent to the appalling

conditions in which the bulk of her own people were living. Dickens was ashamed at the negro slavery in America, at a time when American slave-owners, who visited England, were shocked at the condition of the working classes, and particularly by the inhuman practice of child-labour. The last was one of the worst evils of that time. Employers found that much mine and factory work could be done by children at one penny per day. The vast increase in the population gave them a plentiful supply of this type of labour. A man could get a shilling a day in a factory. So, if he could bring twelve children with him, he could double it. The whole thing seems to us to-day an unspeakable outrage. Unfortunately, it is true. And this contrast alone indicates tremendous progress when we compare the conditions of labour to-day with those we have just been describing. Let it not be imagined that we are contending that we have in any way reached perfection—very far from it. There is much to be done yet in many directions in the improvement of labour conditions, but this must not blind us to the fact that great progress indeed has been made in the last century.

THE FACTORY ACT OF 1833

The first step towards the abolition of this state of affairs was the Factory Act of 1833. This Act provided:

- (1) An eight-hour day for children under 13.
- (2) A twelve-hour day for children between 13 and 18.

A tremendous concession, or one that was at any rate regarded as tremendous in those days, was made when it was conceded that Saturday was to be a short working day, viz. nine hours!

One of the chief reasons of this dreadful state of affairs was the tremendous gulf between the rich and the poor. The rich lived much more in a world of their own than they do to-day. They really did believe themselves to be a class apart, a different species from their poorer

fellow-beings. Disraeli, in one of his novels, after describing child slavery in the mines, puts into the mouth of an aristocrat the following words:

"The rate of wages is sure, and every man is sure of his 7s. a week for nine months in the year. And for the other three they can go to the workhouse; and a very proper place for them. It is heated with hot air and has every comfort. The agricultural poor are very well off indeed. Their incomes are certain, and they have no anxieties; they always have the workhouse. They have no cares, and therefore do not require so much food as those whose responsible positions entail anxieties."

AGRICULTURAL RIOTS

This quotation gives us an idea of the mental attitude of the great landlords and aristocrats of that period. Another indication of the state of affairs was an event which practically amounted to a peasant rising in 1831. There were riots by the agricultural labourers in some of the southern counties. They wanted half-a-crown a day. There was no bloodshed, and very little property was destroyed. There was a Whig Government in power which, in a fit of panic, adopted cruelly drastic measures against them. Several were hanged and 450 transported. This was only a century ago. It seems incredible to us that such savagery should have been possible on the part of a British Government and the British Law Courts on the threshold of the modern era. The change in the Government's attitude to-day as compared with the Government of that period is so complete that it amounts to a drastic revolution in statecraft.

GOVERNMENT'S ATTITUDE TO-DAY AND THEN

To-day the hand of the Government is to be seen everywhere, and generally, even if its hand is firm, its attitude is benevolent. Even though we may at times

accuse the Government of fussy interference, it is acting for what it believes to be our good.

The Government is out to do away with overcrowding, disease and misery. Compare this with the following account of the responsibilities of a Lancashire mill-hand in 1840, as viewed by the Government of that day:

"A Lancashire mill-hand had no need to keep his home healthy; his wife could with absolute impunity let the babies die; he and she could send their little children to work long hours in mine and factory; the whole household could live as it chose, though it might be infecting all its neighbours."

And so typhus, cholera and smallpox swept through the slums and the country villages in wave after wave. The above quotation is extracted from "Cambridge Modern History." Further harrowing details are to be found in the reports of Parliamentary Commissions of that period.

HEALTH AND HYGIENE

Nowadays everyone who is employed, whether a mill-hand or not, must, at once, give notice if an infectious illness breaks out in his home. He is compelled to send his children to school, and not allowed to send them to the mines. The Government insists that there should be a proper water supply everywhere, proper drainage and sufficient sanitary conveniences. We have to-day in this country 700 municipal hospitals.

TREATMENT OF DISEASE

Now let us consider some of the great changes in the treatment of disease which have brought about great improvements in social conditions.

There is the introduction of chloroform, which took place in 1847.

There is antiseptic surgery, first used by Lord Lister, as a result of which the number of deaths from serious

operations has been reduced from 45% to 12%, and a great saving of life has been effected through rendering possible many operations which could not be attempted before.

The coming of the hospital nurse, the district nurse, and professional nurses generally, constitutes another great item of progress. Charles Dickens has given us a picture of a nurse of a hundred years ago in the name of Mrs. Gamp. She has been described as "a perfect triumph of fiction." This is true. Charles Dickens did create Mrs. Gamp, but to quote G. K. Chesterton: "He stamped out of English life, for ever, the foul original from which she was taken." Compare her with the ideal towards which the modern nursing profession looks for guidance—Florence Nightingale.

Further evidence of the improvements which have taken place is to be found in a recent report of the Chief Government Medical Officer of Health. We are told that between 1910 and 1934 the death-rate fell from 13 per thousand to 9 per thousand, a reduction of nearly one-third in a quarter of a century; and that the mortality among children, less than one year old, fell in the same period from 105 per thousand to 64 per thousand. In 1933 the number of under-nourished children was 4%, the lowest on record, and it may be that these 4% need not have been under-nourished if their parents had made use of the facilities offered by municipal and government authorities.

In 1833 began a series of Acts of Parliament, which effected immense improvements in the conditions of labour in mines and factories. Hours were greatly shortened during the ensuing century and women and children were completely excluded from the mines.

ARTIFICIAL LIGHT

Another great improvement has been the development of artificial light. A hundred years ago the world was

terribly dark at night according to our present standards. Before 1827 lucifer matches were unknown. It is probably difficult to realise what a tremendous difference the introduction of these small and simple things made. They were invented by a man named Walker, a druggist of Stockton. He sold them at the rate of one shilling for a box of 84 matches. At the same time the use of mineral oils as fuel for lighting was discovered, and the world was endowed with efficient lamps and matches. These two things, the lucifer match and effective oil-lamps, were themselves an innovation of a revolutionary character. What, then, is to be said of the revolution created by gas and electric light?

It may seem incredible that before 1857 you were not allowed to have a window in your house without paying a Window Tax. Think what this means. The Government actually made it difficult for people to have light in their dwellings if they were poor. In modern times, when such emphasis is laid upon the health-giving properties of light, this seems akin to barbarism.

HOUSING AND RECREATION

Compared with the life they lead to-day, the masses were "imprisoned" up to a century ago. They lived in mean, narrow, dark streets, in back-to-back hovels, and they had no means of getting away from their surroundings. Some seventy years ago came another revolution—the bicycle. Think what a difference this made to people who could not afford horses and carriages or railway fares.

PETROL

And now we come to petrol. In our own time this has caused a great revolution in social life. It has altered our ways of living and on the whole improved them. The changes made by the motor-bus and the

motor-car in this way have opened up new vistas to people. The motor-bus has brought undreamt of relaxation to "tired limbs and modest purses." And let us not forget the charabanc or motor-coach as we are beginning to call them these days. Before the advent of all these petrol-driven conveyances, many East-enders would spend Saturday night in the Gin Palace, and Sunday sleeping it off. In these days they spend it on the beach at Southend.

Think how wireless has brightened the homes of millions of people, and how it has broadened their outlook and their sympathies. Millions of people heard the Coronation service of King George VI. The importation of music by the wireless into the homes of millions must be regarded as a social revolution of immense importance. Less than a hundred years ago you were not allowed to have music of any kind in your homes on Sundays. It was against the law. In 1856 a movement was begun to introduce bands into the parks. In Manchester they were immediately stopped. Lord Palmerston, the Prime Minister, was forced against his will to silence the military bands on Sunday in Kensington Gardens.

TEMPERANCE

Another sphere in which a great advance has taken place is temperance. Unquestionably drunkenness was at one time a national vice. No one could fairly say such a thing of England at the present time. Let us consider the evolution of "drink" in England during the last two or three centuries.

The population of the country in 1688 was 5 million and 12 million barrels of beer were brewed. This works out at $2\frac{1}{2}$ barrels per head per annum, and certainly suggests that beer was then the national drink. It is true that the beer was mild, but also that hardly anyone, even children, touched water in those days. A learned writer of the period expressed the view that children

should only drink small beer! The reason for not drinking water was, of course, the bad state of sanitation.

Until the beginning of the eighteenth century, spirits were consumed only in very small quantities. The tax on brandy and rum was so severe that you had to be rich to get drunk on either. Soon, however, distillers began to produce whisky and gin, especially gin, and it is on record that it was possible for a man "to be drunk for 1*d.* and dead drunk for 2*d.*"

Subsequently, practically the whole of the duty was removed, and by 1751 there were 17,000 gin shops in England, and gin was being consumed to the extent of 11 million gallons per annum, i.e. 2 gallons of spirits per annum per head, including babies. There is a picture by Hogarth in the National Gallery of "Gin Lane." It depicts a London street some two hundred years ago, and makes clear, not only the appalling prevalence of drunkenness, but the equally appalling conditions of life which drove people to seek this refuge from them. Even a hundred years later, the drinking of gin was described by a prominent writer as a national disease calling for kill or cure. Things were so bad that a great temperance campaign was started. It was at this time that the word "teetotal" first appeared in the English language. The origin of this word was a speech by a stuttering temperance reformer at Preston, where he said "Nothing but t-t-total will do."

From then onwards temperance societies began to be formed all over the kingdom. Thousands of people were induced to take the pledge, and drunkenness ceased to be fashionable.

It is definitely open to doubt whether the temperance movement by itself could have achieved much had not a change set in for the better in the conditions of life. At the same time, the temperance movement was helped by the reduction of the tax on tea. When this drink became available, it entered into competition with alcohol as a

popular drink. An Act of Parliament in 1883 also had a great effect. That was the Act which prohibited the payment of wages in public houses. It does not require much imagination to see what a tremendous temptation such payments must have been to the men to spend some of their wages in drink before going home.

THRIFT

Another important result of the growth of temperance is the development of thrift, which is also definite evidence of the increase of temperance, because it is difficult for thrift and intemperance to exist side by side. A striking proof of the volume of savings by people with small incomes is provided by the total sums invested, and standing, in the Post Office Savings Bank, National Savings Certificates, and other funds. These amounted recently to £2,400 millions.

Another great change which has taken place is the growth of the spirit of social service as shown in such institutions as the Salvation Army and the Church Army. In addition to these there are, of course, scores of missions, which run boys' and girls' clubs, and provide poor people with healthy and interesting recreations.

The vastly improved social conditions prevailing to-day find their expression in such movements as the Boy Scouts, Girl Guides, and in the thousands of sporting associations of various kinds throughout the country, as well as the practice of hiking, which is now so general. The idea that "Old England," in addition to being a "Merry England," was a better place to live in than "Modern England" is undoubtedly a fallacy.

YOUTH ORGANISATIONS

One of the most striking features of the present time is the development of *Youth Organisations*. These are likely to come more than ever within the orbit of public

attention when the Government scheme for promoting the physical fitness of the population, through co-operation between public authorities and voluntary organisations, becomes effective.

One of the most important of these movements is the *National Association of Boys' Clubs*, which exists for the purpose of promoting the physical, mental and spiritual health of adolescent working boys, and to make them into good citizens. There are, at present, 1,400 such clubs affiliated to the National Association with a membership of 135,000, most of whom come from the poorer areas of towns in all parts of Great Britain. The number is increasing rapidly.

As is so often the case with British institutions, these clubs at first grew up piecemeal and independently of each other. It was only by slow steps that they got together into larger groups. The first step towards bringing them together arose out of games and sports, and competitions between the various clubs. It was after the First Great War that the National movement began. The building up of character by encouraging healthy interests is the main purpose of this movement. Outdoor and indoor games, physical training, amateur theatricals, debates, handicrafts and camping, are all regarded as means towards attaining the main purpose of the Association. Unquestionably this movement is a great safeguard against the tendency towards degeneration which is always present in crowded cities, and is invaluable to boys when they leave the sheltered life of school, and enter factory life.

A further great impetus is being given to this movement by the *King George V Jubilee Trust*.

SPECIAL AREAS

Important social problems, which give much concern to modern Governments, are those associated with the *Special Areas*. What is meant by this term? It is really

an official term referring to depressed areas, i.e. parts of the country which are in great distress through unemployment caused either by severe trade depression or by industries moving away from the particular district. Many areas have, owing to the latter cause, become permanently depressed, and so serious did the situation become that the Government found it necessary to appoint a Commissioner for these areas in England and Wales.

The distressed areas have reached their lamentable plight largely owing to industrial changes. Most of them depended for their livelihood on iron, coal and shipping. The decline in employment in the coal trade is in all probability permanent. There will no doubt be a tendency to rise and fall as slumps and booms come and go, but the decrease in the demand abroad for British coal is for various reasons likely to continue. Another reason for this is the more economical methods now in force, largely as the result of scientific research, which tend to reduce the consumption of coal. When you add the competition of oil and electricity, it is apparent that the halcyon days of coal production are at an end. We notice here a factor which, whilst it has created unemployment in the coal industry, is a benefit to the rest of the nation.

The same general considerations apply to the *Iron and Shipping Trades*. An appreciable factor in the depressed state of employment here was, of course, due to the general depression, and has been mitigated by the great trade revival now going on; but this will not eliminate those permanent causes of unemployment which are due to the vastly increased efficiency of machinery, and to the loss of foreign trade.

CRIME

One of the social problems constantly confronting the State is that of *Crime*. In modern times the complexity of this problem has been increased by the introduction

of motor-cars and aeroplanes, which have promoted the mobility of the criminal. On the other hand, radio has proved of great assistance to the police. Anthropometric records and photography were introduced by the French *Sûreté Générale*. The reply to the last two methods of detection has undoubtedly in some instances been to attempt to counteract these methods by plastic surgery, which has even been used to alter the pattern of the loops and whorls which constitute the elements of identification by fingerprints. The trouble, therefore, appears to be, where crime is concerned, that *Science* can be made use of by both sides.

We have elsewhere spoken of ultra-violet rays. Here Science has provided the detectors of crime with a weapon which, so far, has not proved to be double-edged. These rays are used in detecting blood-stains. If, under the ultra-violet lamp, a dark-red stain shows up black, there is a presumption that it is blood. Now the biochemist comes along, for the police want to know that it is human blood.

Other rays, besides the ultra-violet ray, are used in police work. Radio-waves, which are long, direct police cars on their way. Infra-red rays make it possible to take photographs through fog, and are used to distinguish between different kinds of ink. Light-waves are used in chemical analysis and make it possible to identify minute quantities of certain materials. X-rays will penetrate the surface of an oil painting for which it is fraudulently claimed that it is by the hand of a famous old master, and so the forger's work can be exposed. The gamma-rays of radium have a legal, though perhaps not criminal, significance through their power to reveal deep-seated flaws in metal castings. They also make it dangerous to steal radium, which gives out these rays, and can cause terrible burns on the person who steals it.

An important use of rays in *Detective Photography* is known as fluorescence. An illustration of its use might

be as follows : We will suppose that a trader has been removing the marks of origin of some commodity which he is selling. There is nothing that the naked eye can see to reveal that he has been doing this. Yet all you have to do is to hold the material for one second underneath an ultra-violet lamp, and the deleted marks shine out. This type of experiment can actually be made in court before a judge and jury. The adulteration of butter with margarine can be identified in this way. The process by which this identification takes place is fluorescence.

Another example of fluorescence assisting in crime detection is connected with forgery, for it reveals anything which has been deleted. The microscope can also be used to show how the pressure of a pen has varied at different points in each letter. It has also been used to detect literary forgery. Here, also, the chemist has on occasion come in to assist, as for instance, where it was found by chemical analysis that a literary forger had used paper made from chemical wood-pulp which was not introduced until 1874, whereas the work he was forging had been done some twenty years before this date. This testing of material has played an important part in crime detection.

As already indicated, the fraudulent sale of old masters has been a remunerative source of crime, and the examination of these paintings has become a science in itself. Here, in addition to the microscope and ultra-violet rays, chemical analysis of pigments has been brought into play. X-ray photography has also played its part.

Attempts are being made to apply *Psychology* to the treatment of prisoners, and such experience as has been gained is encouraging. It is becoming recognised that many cases which come up in the police-courts are more suitable for psychological treatment than for punishment. For instance, many petty thefts by young people seem to

have no motive. Study of individual cases has shown that these and other crimes are often due to home conditions. Frequently the only effect of imprisonment in such cases would be to aggravate them, whereas, by tackling them at the source, they could be remedied.

CHAPTER XXII

BUILDING

Transitional Period—Steel Houses—Revolution in Construction—Plastering—Mass Production—Standardisation of Materials—Sun-planning, Heating and Ventilation—Engineering Structures—Electric-arc Welding—Building Materials—Pile-driving—Slum Clearance.

TRANSITIONAL PERIOD

THE First World War marked a definite transition in the building industry. It may be interesting to compare the industries of house building and motor-car building. Motor-cars were greatly improved, and their prices greatly decreased. Moreover, it became possible to produce them in sufficient quantities to meet the demand.

The position has been different in relation to houses. For a long time it was impossible to meet the demands, so that prices rose rapidly. Very little improvement, if any, took place in their quality; and, while modern conveniences have been installed, the improvement in this respect is in no way comparable with that which has taken place in the motor-car. It has been possible to apply mass-production methods to the manufacture of cars. In this sphere also intensive research and invention have played an important part.

With regard to houses, however, it is necessary to build them relatively slowly on a particular site, and, on the whole, the traditional methods of production and construction have remained in force.

Many attempts have been made to revolutionise housing by applying mass-production methods and the latest technical processes. At various times attempts

have been made to introduce mass-produced steel houses, and attempts were made to produce cottages of concrete, cast in moulds. These projects have generally failed.

Why have they failed?

Generally speaking, the answer is that they have not provided people with the commodity they require. There have been other reasons, such as resistance of the Building Trade Unions, on the ground that steel houses would disorganise the traditional building crafts, and introduce unskilled, in the place of skilled, labour.

STEEL HOUSES

One of the objections to steel houses was the corrosion of the steel skin. It is true that this defect has been overcome in other industries such as ship-building. To accomplish this, however, constant repainting is necessary. The occupants would undoubtedly consider this a most objectionable nuisance. It would mean a revolutionary change in the methods and outlook of builders and local authorities.

Another serious objection to steel houses is condensation. It was found, where such houses were constructed, that moisture condensed on the ceiling and walls in an objectionable manner.

It has to be remembered that, whereas a primitive house is primarily a shelter against wind and weather, in civilised communities it means a lot more. It implies warmth, dryness and privacy, which are, in these days, greatly prized by nearly everybody.

The older type of house, on the whole, conforms to these standards. Its walls are thick, keeping the warmth in the rooms in the winter, and keeping them cool in the summer. They kept the rain out, and there was no condensation inside. The thickness of the walls made dwellers immune from being troubled by noisy neighbours. However, these houses took a long time to con-

struct, and such methods have not been possible during the last two decades.

REVOLUTION IN CONSTRUCTION

Something like a revolution took place in *Constructional Methods* with the arrival of the framed steel or reinforced concrete building, especially of large buildings. This method, by requiring less material in walls, effects considerable economy. The walls can be made much thinner owing to the fact that the whole of the weight is thrown on the frame.

These methods had their drawbacks. If you made your outer walls too thin, you tended to lose heat too quickly. If you made your inner walls too thin, noise passed too easily from one room to another. This latter objection was a serious one in modern times, considering the rate at which enormous blocks of flats were being erected everywhere. In these flats you not only had the objection of noise within the home, but of noise from neighbours. We are all so made that we are much less ready to tolerate noise from our neighbours than we are from our own folks.

There were certain other features in the new construction which made for noise; the pipes and steel beams which run for long distances through great modern buildings are excellent conductors of sound, so that some of these modern edifices were veritable pandemoniums.

These constituted some of the problems dealt with in Building Research Stations.

The great need to-day is good houses at reasonable prices. We must have rapid construction, because new buildings of all types are required and required quickly. We must have materials and designs of such a nature that damp does not penetrate, or sound carry too readily. Furthermore, the buildings must last a reasonable time, resist corrosion, be properly ventilated and conveniently designed.

Since the conclusion of the Second World War the "Pre-fabricated" house has come on the scene and is still the subject of experiment and controversy.

PLASTERING

An illustration of one of the difficulties confronting the building industry, owing to the revolution which has taken place in methods, is the matter of *Plastering*. Lime is an important element, and is to be found in many different parts of the country. The different limes coming from different localities have different physical and chemical properties, and these affect the setting so that each different kind requires a different technique in handling.

It follows that in former times, when the industry depended for its material upon the district where the construction was being carried out, the plasterer was a craftsman who had his own traditional way of doing things, and that these traditions varied in different parts of the country according to the character of the lime which was produced in each particular district.

To-day things are different. The plasterer has to work in lime which comes from anywhere, and he is liable to make small technical errors. Results of even the smallest errors in plastering may be serious. Most of us at one time or another have heard of a friend, or a friend who has a friend, whose ceiling has fallen down a few months after entering a new house.

There is no doubt that we are still dependent to a large extent upon good craftsmanship, and, wherever we get our lime from, and whatever may be its physical and chemical properties, plastering will not be satisfactorily carried out excepting by trained craftsmen.

MASS PRODUCTION

It may be that, in due course, *Mass Production* of small houses will be introduced. It may be that steel frames,

glass, walls, plumbing, etc., will be made on a large scale in various factories, and assembled just as the parts of a motor-car or an aeroplane are assembled. It may be that in the future people will order a certain make of house just as they order to-day a particular make of car. In the meantime, if we are to have good houses we must have good craftsmen, and the craftsmen must be trained.

Standardisation of Materials.—Until satisfactory standardisation is secured, architects, builders and craftsmen are at a disadvantage because it is not possible to work out a technique of building construction for the benefit of all concerned.

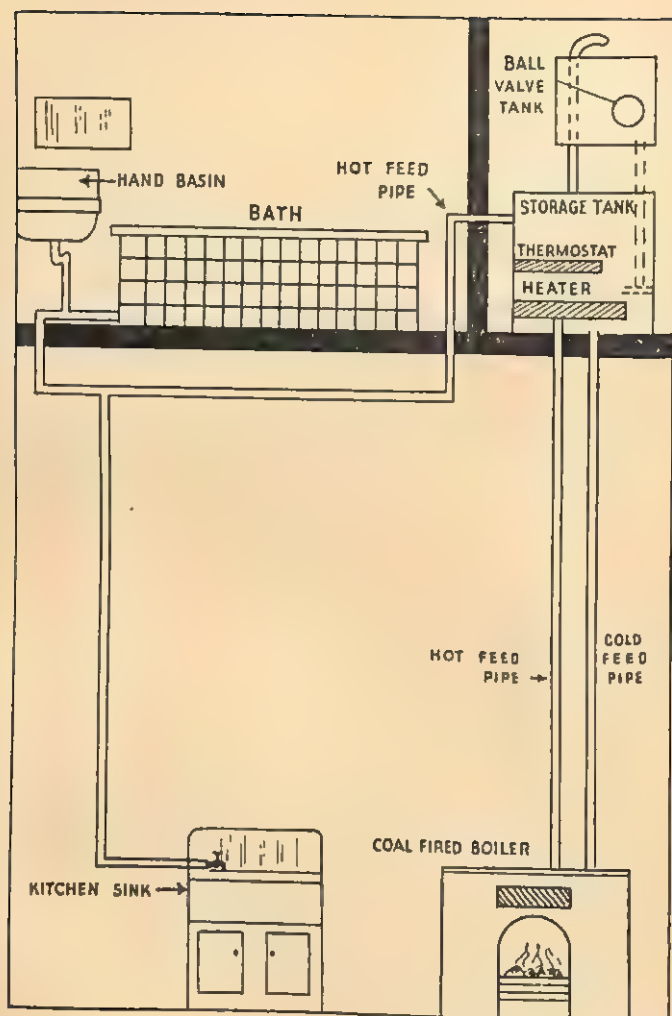
The comfort of the inhabitants of the houses is also receiving a great deal of attention from the scientific experts who are assisting the industry by their researches. Two important aspects are warmth and noise.

SUN-PLANNING, HEATING AND VENTILATION

Sun-planning is coming to the fore, i.e. designing houses so that they shall get the maximum amount of sunshine.

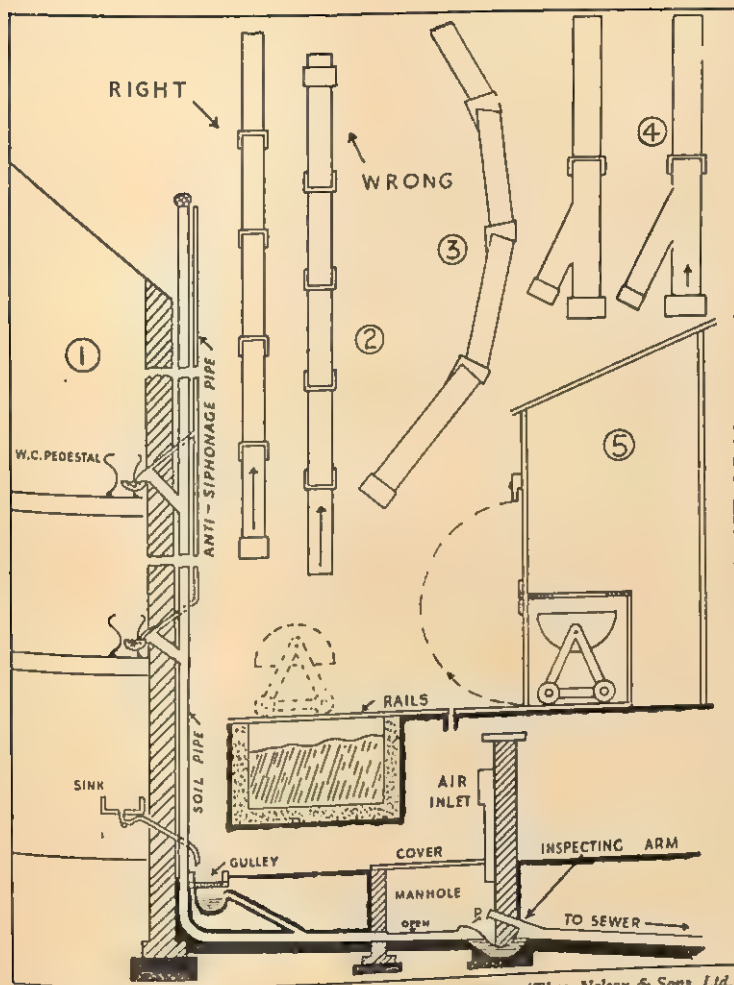
Heating is another subject which is receiving a lot of attention. One of the difficulties of dealing with this aspect of the problem is the variations in the English weather. Our research-workers, however, are overcoming this difficulty by building a house inside an outer set of walls and roof. By this means they will artificially create the degrees of temperature and moisture which they desire, and thus will be able to test the capacity of different types of building materials to stand different types of weather. In this way the heat-retaining qualities of various types of panelling, brick and other materials are being tested.

Ventilation is another problem which is receiving a great deal of attention. And here we have an illustration of the interdependence of the various aspects of our complicated



(The Syndicate Publishing Co., Ltd.)

Sectional diagram showing modern domestic central-heating system. Hot and cold pipes pass through an ordinary coal-fire boiler carrying the water to a storage tank above.



(Thos. Nelson & Sons, Ltd.)

Sanitation: (1) General arrangement of house drainage. (2) Right and wrong ways of laying drain pipes. (3) The wrong way to turn a corner. Proper bends should be used. (4) Right and wrong methods of forming a junction. (5) Suggestion for disposing of soil from earth closet by means of a tilting bucket on truck, emptying into a pit.

modern civilised life. Scientific research-workers for the building industry must here co-operate with such bodies as the Medical Research Association. They have to consider the effect upon the human organism of such types of heating as gas fires, central heating or electric radiation.

ENGINEERING STRUCTURES

We have been dealing on the whole with domestic house construction. There is, of course, a vast field of building apart from houses. Engineering structures, such as bridges, factories, and the huge offices and other monster structures are springing up everywhere.

ELECTRIC-ARC WELDING

In this sphere of industry one of the most remarkable developments has been the making of steel joints by electric welding instead of by riveting. By this means two pieces of steel are melted together by means of an electric arc.

The remarkable growth of the process of electric-arc welding makes this modern method of construction and maintenance one of the outstanding developments in modern industry. Although welding had come into its own long before the outbreak of hostilities of the Second World War, the inherent advantages of simplicity and high speed in metal fabrication made possible by the electric arc were dominant factors in shortening the European war, and assuring a successful conclusion to the conflict in the Pacific.

Not only did welding permit the mass construction of ships, planes, guns, tanks and other essential military equipment in record-breaking time, but the economy effected through its general applications has been responsible for surprising decreases in the cost of producing such material.

Although arc welding has only lately become universally known and only developments in recent years have

led to its widespread use, arc welding is not a recent discovery. It has been in existence almost since arc lights were introduced in 1881.

Following the principles of the carbon-arc light, a Russian by the name of N. V. Bernardos developed a carbon-arc welding process which was patented in 1887.

A few years after the Bernardos patents were issued covering carbon-arc welding, another Russian by the name of Nicholas Slavanoff developed an arc welding process similar to the carbon-arc process, except that the arc is formed between a metallic wire or electrode and the material to be welded. This is known as metallic-arc welding.

An arc lamp has two carbon electrodes with their ends slightly separated. When a powerful electric current passes from one electrode to the other, it has to jump the opening or "gap" between them. In doing so, the electricity generates intense heat between the tips of the electrodes. This intense heat produces the brilliant light, or "arc," from which the arc lamp takes its name.

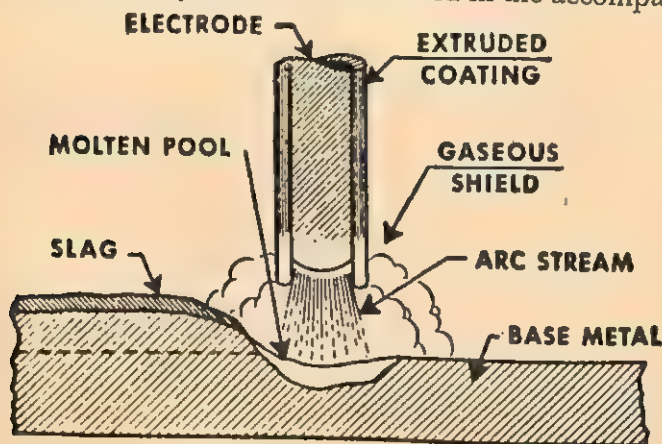
The arc for welding is produced in a similar way except that one tip becomes the material to be welded. A powerful though harmless electric current is forced to jump the gap between the electrode and the material being welded, in order to complete its circuit. Current is carried from the arc welding generator through a rubber-covered wire cable, to the electrode and then across the gap, making the arc do the work, and thence back to the generator through another cable, thus forming a complete electrical circuit. As the electrical current jumps the gap, it generates such intense heat that it immediately melts the metal to be welded. The temperature of the electric welding arc is probably in excess of 6,500 degrees Fahrenheit.

While the arc for an arc lamp and the arc for welding are the same in principle, there is one very important difference. In one instance, the arc heat is used to

produce *light*; in the other, it is used to melt steel!

That's what takes place when a building, automobile, airplane, gun, ship, machine tool or other product is being built by welding. The welding electrode is held so that there is a gap between its tip and the metal which is being joined together. The heat of the welding arc produced by the electrical current crossing the gap melts the end of the wire, or electrode, and also melts the part or parts being welded at the point where the arc touches it. The molten metal from the tip of the electrode flows across the arc to the molten spot of the parts being welded. When the melted steel cools, the parts welded together—no matter how many there are in the particular structure—become one single piece. Not only is the welded structure one integral unit, but when mild steel is used, it is actually stronger in the welds than anywhere else.

The remarkable simplicity of arc welding—its ability to join metal directly together without intermediate connecting members and without the many operations of other industrial processes as illustrated in the accompany-



(Produced by courtesy of the Lincoln Electric Co., Cleveland, Ohio.)

FIG. 1.

ing sketch, Fig. 1—has permitted improved quality and reduced cost of all sorts of products and every type of structure.

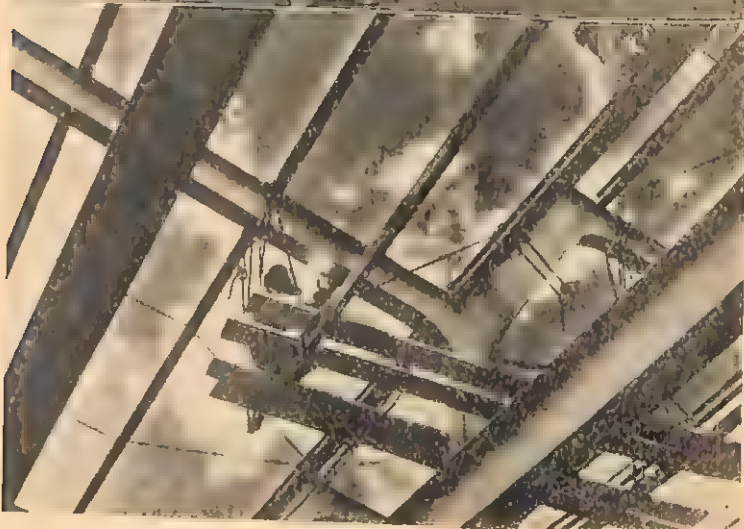
The benefits made possible by welding as compared to other methods of construction have effected such a wide range of items that any attempt to enumerate them would mean listing practically every kind of structure made of metal, from huge battleships and buildings to small parts of delicate machinery.

In addition to making the fabrication of metal structures faster, easier and more economical, arc welding has become more and more versatile for serving its original purposes as a tool for repairing broken parts and resurfacing (building-up) worn surfaces.

The process first received general recognition during World War I when the dynamited cylinders of some interned German vessels were successfully repaired by metallic-arc welding methods. Doubtless one of the reasons for its present widespread acceptance is the fact that the selling price of welding equipment and supplies was continuously reduced over the years during its development. Coupled with the technical advancements and improvements in welding machines, electrodes and techniques, these factors enabled the cost of welding itself to be reduced almost continuously.

Molten steel has an affinity for oxygen and nitrogen. Exposed to air, molten steel enters into chemical combination with oxygen and nitrogen to form oxides and nitrides. These impurities tend to weaken and embrittle the steel as well as loosen its resistance to corrosion.

In an unshielded arc, molten globules which pass from electrode to work are exposed to ambient atmosphere which contains oxygen and nitrogen. Molten base metal is also exposed to these elements. If the metal, during fusion, is completely protected from contact with ambient atmosphere, injurious chemical combination cannot take place. This can be achieved by completely shielding the



(Produced by courtesy of the Lincoln Electric Co., Cleveland, Ohio.)

FIGS. 2 AND 3.



*(Produced by courtesy of the
Lincoln Electric Co., Cleve-
land, Ohio.)*

FIG. 4.



FIG. 5.

arc. Tremendous impetus was given welding by the commercial development of the shielded-arc type of electrode in 1929. This important technical advancement was a vast improvement over the commonly used bare electrode and certain coated electrodes, which were commercially unprofitable owing to high cost and slow speed.

THE SHIELDED ARC.—An arc may be shielded by completely enveloping it with an inert gas, which will not enter into chemical combination with molten metal and at the same time will prevent contact with the atmospheric oxygen and nitrogen (see Fig. 1). Welds made with completely shielded arc are largely free of oxides and nitrides, and are therefore composed of metal having superior physical characteristics to that deposited by an unshielded arc.

In manual welding, the operation of which is shown in Figs. 2, 3 and 4, a shielded arc is obtained through use of specific types of electrodes which are heavily coated. The heavy coating is of such composition that in the heat of the arc it gives off a gas which envelops and shields the arc from the ambient atmosphere.

The action of the arc on the coating of the electrode results in a slag formation which floats on top of the molten weld metal and protects it from the ambient atmosphere while cooling. After the weld metal is sufficiently cooled the slag may be easily removed.

BUILDING MATERIALS

One very interesting experiment in building construction is the *Testing of Bricks*. Different types are left half-buried in the soil for twelve months. If they have been insufficiently burnt or have defects in their composition, they crack and split. This is only one of many tests designed in due course to evolve the perfect brick.

Then there is the *Weathering of Stone*. An important problem here is, not only resistance to ordinary weather, but also to corrosion by noxious gases. The latter, strange

to relate, do more harm in the country than in the town. The reason is that the wind carries these gases away from the towns into the country.

The stone of which many of London's most famous buildings are constructed was quarried in the Isle of Portland, Dorset, and is known as *Portland Stone*. Thomas Hardy, speaking of this island, said that it stretched out "like the head of a bird into the English Channel—a solid and single block of limestone four miles long." From here comes the stone of which St. Paul's Cathedral is constructed. The same is true of the Cenotaph in Whitehall, and the King George V Memorial at Windsor. Sir Christopher Wren was responsible for introducing Portland stone to London. He used it in nearly all his buildings, and his example was followed by his successors. The result is that, until the modern era of huge, steel-framed concrete buildings, the whole appearance of London was dominated by Portland stone.

It is only recently that the new building materials have begun to supersede it, and it now seems only a question of time before the whole face of London is changed. Architecturally it will be a new city.

The chief characteristic of Portland stone is the way its appearance is affected by the weather. The older London buildings shade off from a velvety black at the base to a silvery whiteness which is especially visible on the domes and spires.

This stone was used in some of the new buildings, such as the new London University Building in Bloomsbury, and Australia House in the Strand, but it is doubtful whether the old effects will be visible on these buildings, on account of their massiveness and the absence of domes and Gothic spires, and because they will no doubt be subjected, periodically, to modern processes of cleaning.

PILE-DRIVING

At the present time concrete piles are being used to a

considerable extent. They are apt to splinter or break when they come across a hard layer in the earth's crust, and it is therefore necessary to find out just how much a pile will stand in this way. An interesting device has been invented for testing the powers of resistance of piles:

Quartz crystals with wires attached to them are placed in the interior of a concrete pile, which is driven with differing degrees of force through materials of different strength. An electrical current is conveyed along the wires, through the quartz, while the pile-driving is in process. Quartz alters its electrical resistance under pressure. As a result, when the pile meets different resistances these are at once registered in the quartz, and it is possible by means of the wires to record these variations. The method of recording is by means of photographic film. This is rendered possible by the fact that the flow of electric current along the wires is altered at the same time as the variation in resistance.

SLUM CLEARANCE

The various experiments in building construction that have been referred to in this chapter have an important bearing upon the problem of *Slum Clearance*, which has become more and more prominent of recent years. All sections of the community, all political parties, all intelligent employers and employed are agreed that the slums are a definite evil, not only from the point of view of those who live in them, but from the point of view of the community as a whole.

It is recognised that a person living in the physically degrading atmosphere of a slum cannot be as good a worker, or as satisfactory a citizen, as a person living under healthy conditions. Governments are now making it an important part of their programme to clear slum areas, and re-house the people at present living in them. Much has already been done in this direction, but much remains still to be done. The re-housing of the in-

habitants of the slum areas involves two types of building construction.

Unfortunately for the Government of the country, and its officials on whom falls the responsibility for initiating these housing schemes, the problem is not merely one of construction: it is also an economic problem. It is one thing to build houses, but it is another to let them to those who are going to inhabit them at a rent they can afford, and at the same time make the schemes sound from the financial point of view. Various demands in this direction have to be satisfied. There is a ground landlord, there is the builder, and the owner of the house or flats; there are taxation and rates; there are the problems of transporting these people to their work from the new district to which they have been transferred. It will be clear that important questions of policy are here involved.

EXAMINATION QUESTIONS

1. Choose *two* of the following sports and discuss their attractions from the point of view of the spectator:

Boxing, wrestling, greyhound-racing, horse-racing, dirt-track racing.

2. What changes have been introduced in recent years in the architectural style of large commercial buildings and in the materials used?

3. Steel-frame buildings are apt to be unattractive in appearance. What are the best methods of overcoming this defect?

4. Describe the help which the chemist can give in the investigation of crime.

5. Discuss the desirability of giving instruction at secondary schools in respect of personal health.

6. What is the Means Test? Why is such a test imposed? How far do you consider its continuance desirable?

7. To what extent is the curriculum of the secondary school adversely affected by external examinations?

8. How does the B.B.C. endeavour to educate as well as entertain listeners?

9. What are day continuation schools? What in general are their merits and defects?

10. What elements in your own education do you value most? Are there any with which you would have your children dispense?

11. How do you account for the popularity of greyhound-racing? Would you increase or restrict the facilities for this sport, and why?

12. Discuss the effect of the aeroplane upon international diplomacy.

13. What in your opinion are the outstanding features of present-day architecture? Compare them with past styles.

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PART V
LITERATURE AND ART



CHAPTER XXIII

FAMOUS WRITERS OF RECENT TIMES

Style—Twentieth Century—Poetry—The Novel—John Galsworthy—Thomas Hardy—Arnold Bennett—George Meredith—Joseph Conrad—Rudyard Kipling—D. H. Lawrence—George Moore—Henry James—Dostoievsky—G. K. Chesterton—Gorky, Turgenev and Tolstoy—Proust, Anatole France, Dumas and Rolland.

STYLE

THE greatest writers are almost always simple and straightforward in their style. Obscurity of style is usually associated with mediocrity and lack of ideas and inspiration. It is true that occasionally when a writer is struggling to express a difficult and complicated series of ideas, he may express himself obscurely; but you may be quite sure it is through no wish of his own, and this does not alter the fact that the majority of great writers are easily read. They are, in fact, superlatively sane people, who see life steadily, and see it whole, and with a clear vision. It is the stamp of the greatest writers that, when dealing with life, they keep their heads, and reading their works helps us to keep our heads, and helps us to see our way through what otherwise must often seem a pathless jungle.

Another great value to all of us of these writings is that they enable us to get outside ourselves. to realise that our corner of the world is only a little corner. They also help us to understand ourselves, and broaden our outlook.

If everyone approached literature in this spirit it would be much more popular than it is, and would render happier many lives, embittered by worry and narrowness of outlook. The trouble is to-day that life is lived so

rapidly, and at such high nervous tension, that when people read at all they like to read something which can be disposed of quickly. This has rather the effect of a galloping high-tension film than a book about life, which is clearly a mistake, because we need a contrast to the high tension at which we live, and this is just what we get from reading a good book by a first-class writer.

TWENTIETH CENTURY

We are not by any means compelled to turn our eyes to the past. The twentieth century, both before and after the Great War, has produced a remarkable series of first-class writers in many different spheres of literature. The art of the novel in particular has attracted many able craftsmen and women. It is possibly here, and in the sphere of biography (to which we might possibly add history and popular science), that the greatest literary achievements of the modern world have taken place.

POETRY

In poetry it may be admitted that the known achievements of the present age are not on the same level with those of the nineteenth century, or the Elizabethan age. But it would be a mistake to suppose that what has been accomplished is insignificant. Names to be noted are: *W. B. Yeats, Robert Bridges, John Masefield, Vachel Lindsay and T. S. Eliott, W. H. Auden, Stephen Spender, V. Sackville West.*

There is, again, a wrong attitude about poetry. Many people who could derive great pleasure and benefit from reading poetry deprive themselves of these things through a misconception. The highbrow bogey is once more at work here. Poetry is not always highbrow. It should be read like any other written English. Much of the best poetry is straightforward; and if we remember that we are reading something written in our own language by a

fellow-countryman like ourselves, and differing only from us in that he possesses the power of expressing, beautifully, experiences which he shares with ourselves, we shall find poetry surprisingly easy and pleasant to read.

The psychologists would tell us that in this respect, as in many others, we are suffering from the effects of a number of infantile experiences which have registered themselves in our consciousness, and are constantly preventing us from enjoying and understanding things. In other words, we grow up in the midst of these false notions about literature and other things, and it becomes difficult to break them down when we grow up; but it is undoubtedly worth the effort to break them down, because when we have done so we enter into a new world.

THE NOVEL

The art of *Novel Writing* is not very old. In the form that is familiar to us it is hardly more than a couple of centuries old. "Robinson Crusoe" is probably the first outstanding novel. A great change has taken place in this particular form of literature of recent years. The novel has become a straightforward account of a piece of real life. In the nineteenth century it was the practice of the novelist to depict a life from which certain elements were deliberately excluded, whereas others were idealised. The reader may say, What about Dickens? He surely was realistic enough in his description of the sordidness and misery of certain classes of the community in Victorian times. The answer is "Yes"; but while admitting this truth about Dickens, it must be asserted that his narratives, convincing as they are, and effective as they were in ventilating some of the worst social evils of the time, have a strong sentimental flavour.

It is doubtful whether a modern writer would dare to write in the emotional strain adopted by Dickens. He would be afraid of ridicule. We have plenty of mordant

criticism of social evils and human failings, but our writers now endeavour to avoid any touch of the sentimental when dealing with subjects of this nature.

Novels fall naturally into groups according to the way in which the authors approach their subject. The bulk of them come into the group of romantic fiction. This type of novel usually depicts the lives of fictitious persons. The characters are seen in action, and the writer is mainly concerned with the events of their lives, the contacts they make with other people and the effects of these contacts upon their fortunes. Another important group is the psychological novel, which is concerned rather with thoughts and feelings of the characters and the reaction of those thoughts and feelings to the events of their lives. A third group, called by the French "*Roman de Mœurs*," has been sometimes described as the sociological novel. This is a clumsy title, and the French one is much neater. This type of novel deals with social conditions, their causes and effects and in particular the behaviour of individuals in different social environments.

We are not proposing to attempt to classify the various novelists under any particular headings. That is not our purpose, and is left to the historian of literature. We propose to draw the reader's attention to a number of prominent writers of recent times with whose names and works they should acquire some degree of familiarity. The classification that we have indicated above will help the student to group these authors in his mind, sort them out, perceive their significance, their purpose and the place which they hold in modern literature. The fact of endeavouring in his own mind to place a writer in his appropriate group will be a help to the student's memory as well as to his understanding.

The examination student in particular will find it useful when answering a question about a particular author to think out for himself the appropriate group in which to place him. The act of thinking this out will give

him a series of ideas which he can work into his answer. It should, of course, be remembered that most authors have characteristics belonging to all three groups. It is the dominant note in the book which determines the group to which it should properly be assigned.

JOHN GALSWORTHY

This author is known to the public chiefly through the "Forsyte Saga." This book is an amalgamation of three novels written separately, namely, "The Man of Property," "In Chancery" and "To Let." It is a kind of epic of the Victorian and Edwardian upper middle class. It is an impressive piece of work and the characters themselves are impressive people, and the book will possibly rank as a classic of English literature in the same way as *Fielding's* "Tom Jones." The subject-matter is totally different from that of *Fielding's* book, but both are realistic accounts of the living people of two different periods of our history. Both *Fielding* and *Galsworthy* make their characters live in a manner which is a mark of the great novelist.

Galsworthy is equally effective in another trilogy called a "Modern Comedy," which deals in the same convincing manner with the same stratum of English society. *Galsworthy's* greatness is perhaps in nothing so marked as in the lightness of touch which he shows in handling some of the typical post-war young people.

THOMAS HARDY

This poet and novelist was born in 1840 and died in 1928. He was awarded the O.M. and is accepted as one of the leading figures in English literature. Most of his work dates in the Victorian era, but such was its quality that it can be read nowadays with probably more pleasure and understanding than it was by most of its contemporaries. *Hardy* had wonderful descriptive powers, both in regard to scenery

and human nature, and his dramatic effects are masterly. His work is mainly tragic: Man is seen therein as the plaything of cruel and relentless forces. Possibly the most beautiful of his books is "*Tess of the D'Urbervilles*." Among his best-known other works are "*Far from the Madding Crowd*," "*The Return of the Native*," "*The Mayor of Casterbridge*" and "*The Dynasts*." The last is a dramatic epic poem dealing with the Napoleonic Wars. Of the Victorian classics, probably Thomas Hardy is the most generally read to-day.

ARNOLD BENNETT

One of the most famous novelists of the Edwardian and Georgian era, Arnold Bennett cultivated two distinct methods. He wrote a number of serious novels in the writing of which he submitted himself to the strictest discipline, and restricted his subject-matter to the facts of life itself, excluding romance excepting in so far as it was true to life. These books were weighty contributions to realistic literature. One is reminded of the great French realists such as *Balzac* and *Zola* when one reads these books of Bennett's. In this category come "*The Old Wives' Tale*" and "*Clayhanger*," whilst "*Hilda Lessways*" and other novels dealing with the pottery district (*The Five Towns*) are in the same tradition.

In these books Bennett deals with ordinary uneventful lives of ordinary people, who are for the greater part of their time absorbed in and by the details of life. Here and there with these books, Bennett has created a character which bids fair to become a classic of literature. Such undoubtedly was Sophia in "*The Old Wives' Tale*," and again Hilda Lessways herself.

Bennett's second method was what he himself described as the pot-boiling method. He wrote a large series of amusing, entertaining and frequently fantastic novels, many of which became best-sellers. Herein he showed

great versatility, because he was undoubtedly equipped for, and his inclination lay towards, the more serious work. But Bennett was a clear-headed matter-of-fact person who faced the issues of life with a steady eye, and realised the importance of securing, if possible, a comfortable income. Hence the pot boilers, which have provided thousands of people with the means of whiling away a pleasant hour in a train or on a sea beach.

In his later years Bennett diverted his powers of minute and accurate observation to hotels, and wrote two remarkably interesting novels depicting the life of a manager of a modern *de luxe* hotel. One of these, "Imperial Palace," was a masterpiece, both of characterisation and of accurate observation of an interesting and important phase of modern life.

In the opinion of many, the serious portion of Bennett's work will be valued by posterity for its clear and sober style, and for its accurate description of the life of normal people at the beginning of the twentieth century.

GEORGE MEREDITH

During the 'nineties and the first decade of the present century, no writer in England was held in higher esteem than George Meredith. At the time of his death in 1909, he was regarded as the doyen of English letters, and received an honour rarely bestowed, and considered to be the highest distinction which it is possible for a man of letters or science, or indeed of any profession to achieve—the award of the Order of Merit.

To-day his reputation with the general reader is in eclipse. He does not appeal to the majority of people to-day. There is nevertheless little doubt that posterity will look upon him as one of the most distinguished writers of his time. His work is rich in wit and imagination, and throughout there runs a deep mystical love of nature and a vast fascinating erudition.

One of the reasons for Meredith's unpopularity at the present time is probably the fact that his novels deal almost exclusively with the life of the aristocracy of the late Victorian and Edwardian period. It seems to us in these democratic and cosmopolitan times a life apart, quite different from our own. They seem to be people of a different outlook, and living in a different world. And they are too near to us in point of time for us to take an interest in them such as we take in the aristocrats of the France of the seventeenth and eighteenth centuries, or of Imperial Rome 2,000 years ago. The advent of democracy, with the submerging of class distinctions in England, is too recent for people to take a sympathetic interest in the lives of the people with whom Meredith deals in his novels. In this, no doubt, we are mistaken even though we may not be able to help ourselves. They were human beings just as we are, but brought up in a different environment.

Meredith will undoubtedly live also in the literature of our nation for his poetry, which attains a high level both for its penetrating thought and its characteristic rhythm. The most famous of his poems are "Modern Love" and "Love in the Valley." The former consists of a series of sonnets, and the latter is a beautiful lyric with a haunting music of its own.

JOSEPH CONRAD

Having regard to his remarkable command of English, it is an interesting fact that Joseph Conrad was not English born. He was a Ukrainian. For twenty years he was at sea, working as a mate and subsequently a master on merchant ships. Few writers have written with such mystical insight about the sea. Some of his best-known works are "Almayer's Folly," "The Nigger of the Narcissus," "Lord Jim," "Typhoon," "Nostromo," "The Secret Agent," "Chance," "Victory," "The Rescue" and "The Rover."

RUDYARD KIPLING

Rudyard Kipling was a versatile author. He was awarded the Nobel Prize in 1907, and some of his best-known works are as follows: "Plain Tales from the Hills," "The Light that Failed," "Life's Handicap," "Many Inventions," and "Traffics and Discoveries." His greatest work is probably "Kim." He wrote some delightful fantasies, of which the "Jungle" Books, the "Just-so" Stories, "Puck of Pook's Hill," and "Rewards and Fairies" are probably the best.

D. H. LAWRENCE

D. H. Lawrence stands in complete contrast to Kipling. The latter is on the whole an extrovert writer, whereas Lawrence is definitely an introvert. Kipling makes you conscious all the while of a definite, frequently rather metallic, world around you which has to be dealt with. Lawrence on the other hand takes you into the world of feelings and emotions, and mystical promptings. Some of his best-known works are "Sons and Lovers," "The Plumed Serpent," "The Rainbow," "The White Peacock" and "Fantasia of the Unconscious."

GEORGE MOORE

George Moore was a writer with a fastidious taste both in things and in people. His style is classical and he has a great mastery of detail. Among his best-known works are "Esther Waters," "Evelyn Innes," "The Brook Kerith," "Héloïse and Abélard" and "Hail and Farewell."

HENRY JAMES

Henry James was an American novelist who spent most of his life in England and France. He specialised in deep and exacting psychological analysis of character. His best-known works are "Wings of the Dove" and "The Golden Bowl."

DOSTOIEVSKY

The Russian novelist, Dostoievsky, has exercised a great influence upon modern writers in most countries. He was deeply interested in the morbid psychology of oppressed and unfortunate people. No doubt his writings were influenced by the fact that he spent four years in Siberia on account of his political views. His most famous novels are "Crime and Punishment," "The Idiot," "The Possessed" and "The Brothers Karamazov."

G. K. CHESTERTON

One of the distinguished literary men of recent times, G. K. Chesterton stands by himself. He cannot be said to belong to any school, and it would be difficult to find anyone with whom to compare him. He was one of the most individual writers in the whole of our literature. His attitude towards life was essentially his own, and so was his style. His books are full of colour, wit, satire and a sturdy romanticism without any taint of sentimentalism. His stories are lively and romantic, and his characters, frequently clothed by him with fanciful characteristics, are very much alive. He was a great wielder of the paradox. "If, at times, he appears to somewhat overtax this particular form of literary expression, he generally makes exceedingly effective use of it.

Chesterton was a great enemy of humbug and hypocrisy. He was also a great champion of personal liberty, and, like his friend Belloc, constantly tilted at tyranny and political chicanery. Some of his best-known works are "The Napoleon of Notting Hill," "The Man who was Thursday," "The Man who knew too much," the "Father Brown" stories, "The Flying Inn," and "The Poet and the Lunatics."

Chesterton also wrote some very fine verse. The "Ballad of the White Horse" and "Lepanto" are among the best known of his poems.

GORKY, TURGENEV AND TOLSTOY

Maxim Gorky made his name during the days of Czarist Russia before the First World War, when his play "The Lower Depths" created a tremendous sensation and established his reputation. He was a revolutionary and his name is much revered in Russia to this day.

Turgenev was the first Russian writer to gain a world-wide reputation. His novels are realistic and infused with an attitude of protest against the oppression of the peasants in Russia under the Czarist régime. His best-known novel is "Fathers and Sons," and another almost as well known is "On the Eve."

Tolstoy achieved world-wide celebrity as a novelist and a philosopher. His masterpieces were "War and Peace," "Anna Karenina" and "Resurrection." He was the founder of philosophical anarchism, a creed based upon universal fellowship and the abolition of money.

PROUST, ANATOLE FRANCE, DUMAS AND ROLLAND

Marcel Proust is one of the best-known French writers of recent years. His work shows great mastery of detail and psychological analysis, and also gives a complete picture of a definite part of the social fabric. His works have been translated into English by C. K. Scott-Moncrieff. His great work is called "A la Recherche du Temps Perdu." The English title is "Remembrance of Things Past."

Anatole France occupies a place of his own in modern literature. There is nobody quite like him. He combines a charming urbanity with deep erudition. His knowledge of mediæval and classical law is astonishing. This learning of his keeps peeping out in a series of fictional studies of life in its modern setting as well as in historical settings. His best-known works, which have been admirably translated into English, are "The Crime of Sylvestre Bonnard," "Thaïs," "Penguin Island,"

"The Gods are Athirst" and "The Revolt of the Angels."

Alexandre Dumas is famous for his exceedingly readable historical novels. He was amazingly prolific, and cannot be said to have produced a single dull book. It is well known that he employed collaborators, but he was undoubtedly a man of genius, and even if in some instances the bulk of the writing was done by somebody else, the inspiration was always his. His best-known works are "The Count of Monte Cristo," "The Three Musketeers," "Twenty Years After" and "The Black Tulip."

Romain Rolland's "Jean-Christophe" is one of the most celebrated books of recent times. He was awarded the Nobel prize in 1915.

CHAPTER XXIV

MORE FAMOUS WRITERS OF TO-DAY

*Somerset Maugham—Hugh Walpole—H. G. Wells—
André Maurois—Sinclair Lewis—Eric Linklater—A
Galaxy of Modern Writers—History, Travel, Belles-
lettres, Science.*

SOMERSET MAUGHAM

ONE of the most distinguished writers of to-day is Mr. Somerset Maugham, who has achieved fame both as a novelist and as a dramatist. His plays are examples of technical perfection, but they are more than this, they are sincere representations of life and character. They are also pervaded by a delightful spirit of irony, and nothing could be more witty and stimulating than the dialogue. Mr. Maugham is an unusually shrewd observer of human nature, and whilst he never makes the slightest concession to sentimentality he is good-humoured and sympathetic.

His novels bear the same stamp of sincerity as his plays. They are uncannily clever in construction. The reader never experiences a dull moment and yet leaves off with the sense of having been in contact with real life. He has written many short stories which are masterpieces in themselves. His longer books are equally competent and convincing.

Some of his best-known books are "Of Human Bondage," "Cakes and Ale," "Cosmopolitan," "The Moon and Sixpence," "Ashenden" and "First Person Singular."

His best-known plays are "Cæsar's Wife," "East of Suez," "Our Betters," "The Letter" and "The Breadwinner."

HUGH WALPOLE

Hugh Walpole, the author of "The Cathedral," "The Dark Forest," "The Duchess of Wrexhe," "Fortitude," "The Secret City," etc., in his earlier writings confined himself to the traditional method of the novel dealing with a few characters over a fairly short period of time. Walpole has in places a faculty almost amounting to genius of creating local atmosphere, and his character studies are often arresting. But he definitely falls short of the great quality of detached artistic creation which we find in Galsworthy.

H. G. WELLS

No writer of modern times is more famous than H. G. Wells. One of the most remarkable things about this remarkable man is his versatility. Striking also is the way in which he has maintained a high quality in his work in spite of his tremendous output. Mr. Wells has written much besides novels. A number of sociological treatises stand to his credit, as well as the "Outline of Modern History," which was a pioneer work, and set up a new tradition in the approach to history.

His novels, which are too numerous to record here, can be roughly divided into three groups: the psychological novels, such as "Kipps" and "Love and Mr. Lewisham"; the imaginative stories suggested by modern scientific discoveries and theories; and the sociological novels, such as "Tono Bungay," "Mr. Britling sees it through," "The New Machiavelli," "The World of William Clissold" and "A Modern Utopia."

The influence of Mr. Wells upon contemporary thought has been great. His books have been read all over the world, and it would be difficult to estimate the extent to which he has influenced the thought of the present generation and that which preceded it, but it would be easy to under-estimate it. Mr. Wells stands above all for the

scientific outlook upon life. It is in the growth of the scientific attitude that he sees the only hope of humanity in the future. To him science at its best means the clearing away of a vast and frequently poisonous jungle of traditional wrong ways of looking at things. If only the control of the world could be taken over by genuine scientific researchers a new era would, in his opinion, be inaugurated, and wars and the human failing of envy, jealousy and hate would disappear.

Mr. Wells has on more than one occasion indulged in prophecy, and it is certainly remarkable how accurate have been some of his forecasts. In some of his pre-war work he foretold in almost uncanny detail the modern post-war developments of the aeroplane and the motor-car, and he also foretold submarine war.

ANDRÉ MAUROIS

André Maurois wrote with great sympathetic insight about England and the English. His first book of this description, "The Silence of Colonel Bramble," dealt with British officers at the front during the First World War. Maurois as a liaison officer attached by the French High Command to British Staff Headquarters had plenty of opportunity of observing at close quarters the British officer in action. He mixed on terms of the closest friendship and comradeship with these men, and came to understand the fundamental facts of the British character in a way that is rarely to be found among foreigners.

After the war M. Maurois continued to write about the English, and produced some brilliant biographical sketches, among which "Ariel" (concerning Shelley), "Disraeli" and "Byron" stand out conspicuously.

SINCLAIR LEWIS

A prominent figure among American writers is Sinclair Lewis. His most famous creation is pro-

bably "Babbitt." The book of that name, together with "Main Street," "Martin Arrowsmith" and "Dodsworth," are sufficient to place him in the front rank of contemporary novelists. Mr. Lewis is an interpreter and critic of the American Middle West. His criticism at times is caustic, almost bitter, but it certainly rings true. He brings out clearly the narrow provincialism which frequently predominates in the towns of the vast area near the Mississippi basin known as the Middle West. His criticism is all the more effective because it is branded with sympathetic understanding, as is evidenced in the character sketch of "Babbitt." Mr. Lewis brings out into strong relief the vivid, vital force of the American character, its almost childlike simplicity blended with an equally childlike guile. We must remember that the simplicity and the guile are not by any means a special preserve of the Americans. In his later work, Mr. Lewis has addressed himself to the criticism and ventilation of some of the worst social evils in America, such as the prison system.

ERIC LINKLATER

Eric Linklater in "Juan in America" gives us an altogether delightful picture of various phases of American life. There is a lightness of touch in this book, coupled with an insight into human nature on both sides of the Atlantic, which would be difficult to surpass. In "Juan in China" he deals in a similar strain with the Sino-Japanese struggle.

A later book, "Magnus Merriman," is of a different type, and also of a high quality from the literary point of view. Its characters are vividly drawn, the dialogue is delightful in its pungent humour (at times Rabelaisian). Mr. Linklater has a hatred of hypocrisy and humbug, and at times thunders against it with titanic bursts of humour.

He shows himself capable of a delightfully light and

humorous strain in a book called "Poet's Pub." There is a rugged vitality about Mr. Linklater's work that leads us to think that it will live. It has the hall-mark of great literature.

A GALAXY OF MODERN WRITERS

Charles Morgan is a modern novelist who made his name with "The Fountain," a book which has enjoyed great popularity, especially among those who enjoy psychological studies. Mr. Morgan is a subtle craftsman, and this book contains a careful and profound story of the effort of a modern man to achieve happiness and peace of mind through self-discipline based upon a mystic idea.

Ernest Hemingway is a living writer of considerable distinction who combines an effective simplicity of style with entertaining narrative. He is modern and cultivates the short, snappy dialogue of the day. His work is always interesting and entertaining, even if, like so much modern work, it is somewhat difficult to discover permanent values. Some of his best-known works are "A Farewell to Arms," "In our Time," "Men without Women" and "The Sun also rises."

Robert Graves has departed recently from his earlier style of disillusionment, and produced two remarkable books dealing with the life of a Roman Emperor, "I Claudius" and "Claudius the God."

Joseph Hergesheimer, an American novelist, has deservedly achieved fame in both continents. His best work is probably "Java Head." This book contains a remarkable variety of different characters, all of whom are vividly and convincingly portrayed. The book is picturesque and frequently exciting. It is undoubtedly a first-class literary work of art. Other books by the same author are "The Bright Shawl," "Cytherea," "The Limestone Tree" and "The Three Black Pennys."

Aldous Huxley is probably not only the most distinguished but the most characteristic among the writers of

the decade following the First World War. It is perhaps for him a tragedy that he "dates" in this way. An extremely brilliant intellect, coupled with an extreme æsthetic sensitiveness, has no doubt intensified in him the disillusionment which followed the great catastrophe. This, no doubt, accounts for a certain harshness in his work, and a tendency to introduce ugliness at times unnecessarily. One feels when reading his books that the author is afraid of allowing his readers to forget that there is much in life that is ugly and cruel, and one cannot help feeling that he has allowed his artistic sense to be frequently overcome by a tendency to introduce irrelevant moralising into the sphere of artistic creation.

To those who are familiar with Mr. Huxley's work, it may seem strange to suggest that he is given to moralising. But we are inclined to think that below the surface this is what he is frequently doing. There is a certain element of the macabre frequently present in his work, and it is at least open to question whether this is not due to suppressed irritation at the contradiction between modern civilisation and his own æsthetic and moral ideals.

Some of this writer's best-known works are "Antic Hay," "Crome Yellow," "The Three Graces," "Point Counterpoint," "Those Barren Leaves" and "Brave New World."

James Joyce is best known by his work "Ulysses." This is an extraordinary piece of work, where great scholarship and erudition are mixed up with psychology, philosophy, physiology and satire. It would appear that the author is endeavouring to render in his work the bewildering complexity of human circumstances and of the psychological make-up of human beings. People of all types and classes pass through its pages, from lawyers and shopkeepers to priests, policemen, undertakers and typists.

Richard Aldington is best known for two of his books, "The Death of a Hero" and "All Men are Enemies."

The former is a war book which shows a masterly descriptive touch as well as fine mordant humour. The latter has a much wider scope. There is a strong, beautiful and touching love interest in this book which never lapses into sentimentalism.

Sherwood Anderson, the author of "Dark Laughter," "Many Marriages," "Poor White" and "Winesburg Ohio," is a champion of the dark races. It is remarkable how this writer seems to convey the mentality and emotional states of the negro of North America. He has been regarded by some of his critics as too one-sided, and from this point of view he can hardly be regarded as ranking among the greatest novelists whose outlook is universal rather than parochial.

Theodore Dreiser is an American writer who has made a great name. His best-known works are "An American Tragedy," "A Book about Myself," "Dawn," "The Financier," "The Genius," "Jennie Gerhardt" and "The Titan." Mr. Dreiser is in deadly earnest. He does not allow himself to be drawn aside into the paths of romanticism. He is a sympathetic, philosophical observer. He does not attempt to conceal the mixture of people's motives, their selfishness, their helplessness, their futility, but he is in close sympathy with the human struggle. He seems to partake of the clear-headedness of the French novelists with their contempt for humbug and sentimentalism.

Louis Bromfield is an American writer of great talent. His earlier work, viz. "Early Autumn" and "The Green Bay Tree," is in the tradition of the carefully constructed novel. His later work, "Twenty-four Hours," is modernist, but carefully constructed with a certain regard for traditional methods. In "The Strange Case of Miss Annie Spragg" we have a book which is the quintessence of modernism. It is a brilliant and penetrating study.

Thornton Wilder is another American writer of distinc-

tion, who sprang suddenly into fame with "The Bridge of San Luis Rey." This is a brilliant book. It is classic in the perfection and purity of its style, and in the careful building up of the story, which is constructed with all the care which the classical painters devoted to the composition of their pictures.

J. B. Priestley, the author of "The Good Companions," "Angel Pavement" and "Adam in Moonshine," appears to have three distinct styles. The first of these books was received with well-merited acclamation by the public. It is full of shrewd observation of human nature, genial humour and interesting incident. The second is in the tradition of Arnold Bennett's stern realism, and the third is a delightful fantasy.

The following are some of the best-known Women Novelists of the day:

Vicki Baum is a German writer who achieved fame with her novel "Grand Hotel," a brilliant and vivid piece of work. Other books by her are "Secret Sentence" and "A Falling Star." The latter is an interesting romance of Hollywood.

Margaret Kennedy made her name as the author of "The Constant Nymph." This is a work of fiction which deservedly achieved great fame, and has subsequently been dramatised and filmed. Since then Miss Kennedy has written other fine novels. She is a writer of real distinction.

Selma Lagerlöf won fame with her book "Gösta Berlings Saga." This consists of a series of short stories of peasant life. She is regarded as one of the best novelists produced by Sweden, her reputation is European, and she was awarded the Nobel Prize in 1909. Other works by her are "Invisible Links," "Jerusalem," "The Adventures of the Nils" and "An Autobiography."

Rose Macaulay is one of our most distinguished modern novelists. She has a light touch, but at the same time conveys a vivid impression of personality through her dia-

logue. Two of her best-known books are "Potterism" and "Told by an Idiot."

Rebecca West is one of our keenest critical intellects. Her works are full of illuminating flashes of insight into some of the most difficult personal problems affecting our highly civilised modern human products. She may be described as a philosophical student of human personality. Two of her best-known works are "Harriet Hume" and "The Thinking Reed."

Virginia Woolf is a novelist, but her methods are not conventional; that is to say, she does not attempt to give us a complete picture of one or more personalities. Her endeavour is to let her characters appear in her books as people appear in ordinary life to other people. In other words, she seeks to give us a succession of brief glimpses of them. This is a complete departure from the traditional method of the novel. Among her best-known works are "Jacob's Room," "Mrs. Dalloway," "Orlando," "To the Lighthouse" and "The Waves."

G. B. Stern has given us a series of entertaining novels, presenting a large number of characters, neatly and vividly portrayed. In her series beginning with "Tents of Israel," she adopts the family-chronicle method, and thus falls into line with a strong modern tendency which has produced what Miss Elizabeth Kerr has described as the "sequence" novel. This type of novel usually covers a considerable period of time, and includes a large number of characters. It is open to question whether this method is as successful as the old-fashioned method which observes the "Unities." There is a tendency for dramatic effect to lose its intensity, and for characterisation to lose in depth what it gains in multiplicity.

Edith Wharton's work dates from the beginning of the century and, therefore, has the great interest of being the product of the pre-war and of the post-war periods. Her earlier work is in the tradition of *George Eliot*, but her

later, whilst never wholly departing from the tradition of formal composition which ruled in the pre-war period, is adapted to the modern point of view. Some of her best-known works are "The Age of Innocence," "The Children" and "Hudson River Bracketed."

Sigrid Undset, the author of "The Acts," "The Son Avenger," "Kristin Lavransdatter" (including "The Cross" and "The Mistress of Husaby"), is concerned mainly with human emotions. Her characters are very skilfully drawn, and she succeeds in giving us a sense of the acuteness of their emotions without using crude or heavily dramatic phraseology. When dealing with emotional states she works by suggestion rather than direct description. Her books are biographical or chronological in form, usually cover a considerable period of years, and have an effect of panorama, including a large number of characters, and frequent historical episodes. This tendency towards historical, panoramic methods in the novel has become fashionable of late. We find it in such books as Hugh Walpole's.

HISTORY—TRAVEL—BELLES-LETTRES—SCIENCE

The following writers are prominent in various spheres:

Professor Bury, in the realm of history, has written the "History of Ancient Greece" and the "History of Rome." In these books this great historian has made the ancient world live for his readers. As an historian he combines meticulous accuracy with a vivid and attractive style. His book, "The Idea of Progress," is stimulating, original and full of erudition and accurate scholarship.

Professor G. M. Trevelyan is another distinguished historian who writes attractively about certain periods of English history. Perhaps the best known of his works are those dealing with the reign of Queen Anne, the Duke of Marlborough and his "History of England."

Arthur Bryant has made *Charles II* live in his brilliant biography of that monarch.

Lytton Strachey had a remarkable gift for imaginative presentation of people and periods. His best-known writings are "Eminent Victorians," "Queen Victoria" and "Elizabeth and Essex."

Among the best travel books of the day are those written by *H. V. Morton*; and no one should miss "The Seven Pillars of Wisdom" by *Lawrence of Arabia*.

In the realm of satire *Hilaire Belloc*, *A. G. Macdonell*, *Evelyn Waugh* and *H. L. Mencken* stand out prominently.

Brilliant essays on most things under the sun have been written by *Robert Lynd*, and a writer who has achieved a considerable popularity for miscellaneous writing, dealing lightly with various aspects of life, is *Beverley Nichols*.

The student should keep himself in touch with what is best in current thought. To assist him a few of the most distinguished exponents of current leading ideas in *Science and Philosophy* are dealt with in the following paragraphs :

Evelyn Underhill writes clearly, attractively and convincingly on the subject of *Mysticism*, whilst *Bertrand Russell* and *C. E. M. Joad* bring *Philosophy* to the doors of those who are not trained in the technique of metaphysics.

Wyndham Lewis tilts with gusto at many modern writers in his "Time and Western Man." He stands for the time-honoured modes of thought of the sages of antiquity. On the other hand *Otto Spengler* in his "Decline of the West" puts forward a plea for new ways of thought, bred of mechanistic civilisation.

Professor Sir James Jeans, in "The Mysterious Universe," talks to us entertainingly about the structure of the stellar universe, whilst *Professor Julian Huxley* expounds to the intelligent layman the mysteries of biological science.

J. W. N. Sullivan in a series of brilliant books has interpreted the mathematical and other aspects of science to the layman.

Among the many able writers on Economics and Sociology to which the student is referred are: *G. D. H. Cole, Sir William Beveridge, Professor Keynes, Professor Robbins* and *Professor Clay*. These writers are mainly concerned with various aspects of economics. *Professor Laski* writes illuminatingly on many social problems.

The reader should understand that no attempt has been made here to give a comprehensive list of authors of the present day who are worthy of note. A number of prominent writers have been selected who are representative of certain tendencies in modern literature. There are many other writers of high merit and great significance to whom the space at our disposal does not permit us to refer.

The fact that space does not permit of more than listing the following writers must not be taken as in any way suggesting that their literary value is inferior to those who have been mentioned above. Nor must the list be regarded as comprehensive. The enterprising and discriminating student will decide for himself what names to add and what names to subtract from the list:

C. S. Lewis, Compton Mackenzie, Upton Sinclair, Peter Cheyney, Edith Sitwell, Osbert Sitwell, Sacheverell Sitwell, Alexei Tolstoy, George Borodin, Olaf Stapleton, Lewis Mumford, A. N. Whitehead, H. M. Tomlinson, Ivor Brown, J. A. Spender, R. T. Gould, Dorothy Sayers, Agatha Christie, Ngaio Marsh.

The following French writers, some of whose works have been translated into English, are in the front ranks of contemporary literature. They are as follows: Simenon, inventor of "Inspector Maigret"; his works have been translated into eighteen languages and twenty-two of them have been filmed.

Aragon, author of "Servitude et Grandeurs Françaises."
Georges Duhamel, author of "Cécile among the Pasquiers" (translated).

François Mauriac, author of "A Woman among the Pharisees."

Pierre Maillaud: "France."

Vercors, author of "Le Silence de la Mer." Has been described as the biggest best-seller in Britain, of the French Resistance.

The student should devote a little while each week, say an hour, to scanning the book reviews in one of the following papers: "The New Statesman," "The Spectator," "The Sunday Times," "The Observer," "Time and Tide," and "The Times Literary Supplement." He should make a note of those books and authors who are singled out by the reviewers as important. If he does this consistently and classifies the authors in his notebook under such headings as Fiction, Poetry, Drama, Biography, Science, Philosophy, History, Belles-lettres, he will soon find that he has equipped himself with an intelligent guide to modern literature and thought.

The following list of eminent writers is given in the "Authors' and Writers' Who's Who" (Shaw):

GIANTS OF LITERATURE

Addison, Joseph, 1672-1719; English essayist and poet.

Æschylus, -456 B.C.; Greek dramatist.

Ainsworth, William Harrison, 1805-1882; English novelist.

à Kempis, Thomas, 1380-1471; English essayist.

Andersen, Hans Christian, 1805-1875; Danish novelist.

Apuleius, Lucius, A.D. 125- (not known); Platonic philosopher.

Ariosto, Ludovico, 1474-1532; Italian poet.

Aristophanes, 444-384 B.C.; Greek dramatist.

Aristotle, 385-322 B.C.; Greek philosopher.

Arnold, Matthew, 1822-1888; English essayist and poet.

Aurelius, Marcus, A.D. 121-180; Latin historian and essayist.

- Austen, Jane, 1775-1817; English novelist.
Aytoun, William E., 1813-1865; Scottish poet.
Bacon, Francis (Lord Verulam), 1561-1626; English essayist.
Balzac, Honore de, 1799-1850; French novelist.
Bandello, Matteo, 1480-1562; Italian novelist.
Barrie, Sir J. M., 1860-1937; Scottish playwright and novelist.
Baudelaire, Charles Pierre, 1821-1867; French poet.
Beaumont, Francis; 1586-1615; English dramatist.
Bennett, Arnold, 1867-1932; English novelist.
Blackmore, Richard Doddridge, 1825-1900; English novelist.
Blake, William, 1757-1828; English poet.
Boccaccio, Giovanni, 1313-1375; Italian novelist.
Boileau Despreaux, Nicholas, 1636-1711; French poet and critic.
Borrow, George, 1803-1881; English essayist.
Boswell, James, 1740-1795; English biographer.
Bridges, Dr. Robert, 1844-1930; English poet.
Brontë, Charlotte (Currer Bell), 1816-1855; English novelist.
Brontë, Emily, 1818-1848; English novelist.
Browning, Elizabeth Barrett, 1806-1861; English poet.
Browning, Robert, 1812-1889; English poet.
Bunyan, John, 1628-1688; English allegorist.
Burke, Edmund, 1729-1797; English political writer.
Burns, Robert, 1759-1796; Scottish poet.
Butler, Samuel, 1835-1902; English novelist.
Byron, George Gordon, Lord, 1788-1824; English poet.
Cæsar, Julius, 100-44 B.C.; Latin historian.
Calderon, de la Barca, Pedro, 1600-1681; Spanish dramatist and poet.
Camoens, Luis de, 1524-1579; Portuguese poet.
Carducci, Giosue, 1836-1907; Italian poet.
Carlyle, Thomas, 1795-1881; English historian.
Catullus, Gaius Valerius, (?)84-54 B.C.; Latin lyric poet.

- Caxton, William, 1421-1491; English essayist.
Cervantes, Miguel de, 1547-1616; Spanish novelist.
Chaucer, Geoffrey, 1340-1400; English poet.
Chesterton, G. K., 1874-1936; English poet and novelist.
Cicero, Marcus Tullius, 106-43 B.C.; Latin essayist.
Clemens, Samuel Langhorne (Mark Twain), 1835-1910; American novelist.
Coleridge, Samuel Taylor, 1772-1834; English poet.
Collins, Wilkie, 1824-1889; English novelist.
Congreve, William, 1670-1729; English dramatist.
Conrad, Joseph, 1857-1925; novelist.
Corneille, Pierre, 1606-1684; French dramatist.
Cowper, William, 1731-1800; English poet.
Dante, Alighieri, 1265-1321; Italian poet.
Darwin, Charles Robert, 1809-1882; English essayist.
Daudet, Alphonse, 1840-1897; French novelist.
Defoe, Daniel, 1661-1731; English novelist.
de Morgan, William, 1839-1917; English novelist.
Demosthenes, 385-322 B.C.; Greek orator.
de Musset, Louis Charles Alfred, 1810-1857; French poet, playwright and novelist.
De Quincey, Thomas, 1785-1859; English essayist.
Descartes, René, 1596-1650; French philosopher.
de Vigny, Alfred, 1797-1863; French poet.
Dickens, Charles, 1812-1870; English novelist.
Donne, Dr. John, 1573-1631; English poet.
Dostoevsky, Feodor Nikkail Avich, 1821-1881; Russian author.
Douglas, George (Brown), 1869-1902; Scottish novelist.
Doyle, Sir Arthur Conan, 1859-1932; English novelist.
Dreiser, Theodore, 1871- ; American novelist.
Dryden, John, 1631-1700; English poet.
Dumas, Alexandre, 1803-1870; French novelist.
Dunbar, William, 1465-1530; Scottish poet.
Eliot, George (Marian Evans), 1820-1881; English novelist.

Emerson, Ralph Waldo, 1803-1882; American essayist and poet.

Epictetus, A.D. 60- ; Greek philosopher.

Epicurus, 342-270 B.C.; Greek philosopher.

Erasmus, 1465-1536; Dutch religious writer.

Euripides, 480-406 B.C.; Greek dramatist.

Evelyn, John, 1620-1706; English essayist.

Fielding, Henry, 1707-1754; English novelist.

Fitzgerald, Edward, 1809-1883; English poet.

Flaubert, Gustave, 1821-1880; French novelist.

Fletcher, John, 1576-1625; English dramatist.

France, Anatole, 1844-1925; French essayist.

Froissart, Jean, 1338-1410; French historian.

Froude, James Anthony, 1818-1894; English historian.

Galsworthy, John, 1867-1933; English novelist.

Galt, John, 1779-1839; Scottish man of letters.

Gautier, Theophile, 1811-1872; French novelist.

Gay, John, 1685-1732; English poet.

Gibbon, Edward, 1737-1794; English historian.

Goethe, Johann Wolfgang von, 1749-1832; German poet.

Goldsmith, Oliver, 1728-1774; English poet.

Gordon, Adam Lindsay, 1833-1870; Australian poet.

Gray, Thomas, 1716-1771, English poet.

Green, John Richard, 1837-1883; English historian.

Grimm, Jacob Ludwig Carol, 1785-1863; German mythologist.

Grimm, Wilhelm Carol, 1786-1859; German mythologist.

Guizot, François Pierre Guillaume, 1789-1874; French historian.

Hakluyt, Richard, 1553-1616; English historian.

Hallam, Henry, 1777-1859; English historian.

Hardy, Thomas, 1840-1928; English novelist.

Harte, Francis Bret, 1839-1902; American novelist.

Hawthorne, Nathaniel, 1804-1864; American novelist.

Hazlitt, William, 1778-1830; English essayist.

Hegel, Georg Wilhelm, 1770-1831; German philosopher.

Heine, Heinrich, 1799-1856; German poet.

- Henley, William Ernest, 1849-1903; English poet and critic.
- Henry, O., 1862-1910; American short-story writer.
- Herodotus, 490-420 B.C.; Greek historian.
- Herrick, Robert, 1591-1674; English poet.
- Holmes, Oliver Wendell, 1809-1894; American writer and physician.
- Homer, 1000 B.C. (approx.); Greek poet.
- Hood, Thomas, 1798-1845; English poet.
- Horace (Quintus Horatius Flaccus), 65-8 B.C.; Latin poet.
- Hugo, Victor, 1802-1885; French novelist.
- Hume, David, 1711-1776; Scottish historian.
- Hunt, James Henry Leigh, 1784-1859; English essayist.
- Huxley, Thomas Henry, 1825-1895; English essayist.
- Huysmans, Joris Karl, 1848-1907; French novelist.
- Ibanez, Vicente Blasco, 1867-1928; Spanish novelist.
- Ibsen, Henrik, 1828-1906; Norwegian dramatist.
- Irving, Washington, 1783-1859; American novelist.
- James, Henry, 1843-1916; American novelist.
- Johnson, Dr. Samuel, 1709-1784; English lexicographer.
- Jonson, Ben, 1574-1637; English poet.
- Josephus, Flavius, 37-97; Jewish historian.
- Juvenal, 50-130; Latin poet.
- Kant, Immanuel, 1724-1804; German philosopher.
- Keats, John, 1795-1821; English poet.
- Kingsley, Charles, 1819-1875; English novelist.
- Kipling, Rudyard, 1865- ; English poet.
- Lamartine, Alphonse, 1790-1869; French poet.
- Lamb, Charles, 1775-1834; English essayist.
- Landor, Walter Savage, 1775-1864; English poet.
- Lang, Andrew, 1844-1912; Scottish man of letters.
- Langland, William, 1332-1400; English poet.
- La Rochefoucauld, Francis, Duc de, 1613-1680; French man of letters.
- Leibnitz, Gottfried Wilhelm Von, 1646-1716; German philosopher.

- Lessing, Gotthold Ephraim, 1729-1781; German critic and dramatist.
- Lever, Charles J., 1806-1872; Irish novelist.
- Livy (Titus Livius), 59 B.C.-17 A.D.; Latin historian.
- Longfellow, Henry Wadsworth, 1807-1882; American poet.
- Loti, Pierre (Pen-name of Louis Marie Julien Viaud), 1850-1923; French novelist.
- Lowell, James Russell, 1819-1891; American poet.
- Lucretius, Titus Carus, 98-55 B.C.; Latin didactic poet.
- Luther, Martin, 1483-1546; German religious writer.
- Macaulay, Thomas Babington, Lord, 1800-1859; English historian and poet.
- Machiavelli, Niccolo, 1469-1527; Italian essayist.
- Maeterlinck, Maurice, 1862- ; Belgian essayist.
- Malory, Sir Thomas, 1434-1470; English mythologist.
- Mandeville, Bernard de, 1670-1733; English philosopher and satirist.
- Marlowe, Christopher, 1564-1593; English dramatist.
- Marryat, Frederick, 1792-1848; English novelist.
- Martial, Marcus Valerius Martialis, A.D. 38-41 to 102-103; Latin epigrammatist.
- Marx, Heinrich Karl, 1818-1883; German political economist.
- Masefield, John, 1874- ; English poet.
- Maupassant, Henri René Albert Guy de; 1850-1893; French novelist and poet.
- Meredith, George, 1828-1909; English novelist.
- Mérimée, Prosper, 1803-1870; French novelist, archaeologist, essayist.
- Mill, John Stuart, 1806-1873; English philosopher.
- Milton, John, 1608-1674; English poet.
- Molière, 1622-1673; French dramatist.
- Moore, George, 1853-1933; English novelist.
- Morris, William, 1834-1896; English poet.
- Munro, Neil, 1864-1930; Scottish novelist.
- Newman, John Henry, 1801-1890; English cardinal and writer.

- Newton, Sir Isaac, 1642-1727; English natural philosopher.
- Nietzsche, Friedrich Wilhelm, 1844-1900; German philosopher.
- Ovid (P. Ovidius Naso), 43 B.C.-A.D. 17; Latin poet.
- Pascal, Blaise, 1623-1662; French philosopher.
- Pater, Walter, 1839-1894; English essayist.
- Pepys, Samuel, 1632-1703; English diarist.
- Petrarch, Francesco, 1304-1374; Italian poet.
- Petronius (Arbiter), -66; Roman poet.
- Plato, 429-347 B.C.; Greek philosopher.
- Plautus, Titus Maccius, 251-204 B.C.; Roman dramatist.
- Pliny, 23-79 A.D.; Roman historian.
- Plutarch, 46-120 A.D.; Roman historian.
- Poe, Edgar Allan, 1809-1849; American novelist and poet.
- Pope, Alexander, 1688-1744; English poet.
- Proust, Marcel, 1871-1922; French man of letters.
- Pushkin, Alexander, 1799-1837; Russian poet and short-story writer.
- Rabelais, François, 1483-1553; French novelist.
- Racine, Jean Baptiste, 1639-1699; French dramatist.
- Reade, Charles, 1814-1884; English novelist.
- Renan, Joseph Ernest, 1823-1892; French essayist.
- Richardson, Samuel; 1689-1761; English novelist.
- Ronsard, Pierre de, 1524-1585; French poet.
- Rossetti, Christina, 1830-1894; English poet.
- Rossetti, Dante Gabriel, 1828-1882; English poet.
- Ruskin, John, 1819-1900; English critic and essayist.
- Sallust (Caius Sallustius Crispus), 86-34 B.C.; Latin poet.
- Sand, George, 1804-1876; French novelist.
- Sappho, 600 B.C. (approx.); Greek poet.
- Schiller, Friedrich Von, 1759-1805; German poet.
- Schopenhauer, Arthur, 1788-1860; German philosopher.
- Scott, Sir Walter, 1771-1832; Scottish novelist.
- Seneca, 5 B.C.-A.D. 65; Latin philosopher.
- Shakespeare, William, 1564-1616; English dramatist.

Shaw, George Bernard, 1856- ; Irish novelist and dramatist.

Shelley, Percy Bysshe, 1792-1822; English poet.

Sheridan, Richard Brinsley, 1751-1816; Irish dramatist.

Sidney, Sir Philip, 1544-1586; English poet.

Smollett, Tobias G., 1721-1771; English novelist.

Socrates, 470-399 B.C.; Greek philosopher.

Sophocles, 496-404 B.C.; Greek dramatist.

Southey, Robert, 1774-1843; English essayist.

Spencer, Herbert, 1820-1903; English essayist.

Spenser, Edmund, 1553-1599; English poet.

Spinoza, Baruch, 1632-1677; Dutch philosopher.

Steele, Sir Richard, 1671-1729; English essayist.

Sterne, Laurence, 1713-1768; English novelist.

Stevenson, Robert Louis, 1850-1894; Scottish novelist.

Strindberg, August, 1849-1912; Swedish author.

Suetonius, Tranquillus Gaius, A.D. 50-120 (approx.); Roman historian.

Swift, Jonathan, 1667-1745; English satirist.

Swinburne, Algernon C., 1837-1909; English poet.

Synge, J. M., 1871-1909; Irish poet, playwright and essayist.

Tacitus, Cornelius, 54-120; Latin historian.

Taine, Hippolyte Adolphe, 1828-1893; French critic and historian.

Tasso, Torquato, 1544-1595; Italian poet.

Tchekhov, Anton, 1869-1904; Russian dramatist.

Tennyson, Alfred, Lord, 1809-1892; English poet.

Terence, 195-159 B.C.; Latin poet.

Thackeray, Wm. Makepeace, 1811-1863; English novelist.

Thompson, Francis, 1859-1907; English poet.

Tolstoy, Count, 1882-1910; Russian novelist.

Trollope, Anthony, 1815-1882; English novelist.

Tschakste, Jan, 1859- ; first President of Republic of Latvia, and writer.

Turgenev, Ivan, 1818-1883; Russian novelist.

- Vega Carpia, Lope Felix de, 1562-1635; Spanish dramatist and poet.
- Verhaeren, Emile, 1855-1916; Belgian poet.
- Verlaine, Paul, 1844-1896; French lyric poet.
- Villon, François, 1431-1463; French poet.
- Virgil, 70-19 B.C.; Latin poet.
- Voltaire, 1694-1678; French essayist.
- Walton, Izaak, 1593-1683; English writer.
- Webb, Mary, 1883-1927; English novelist.
- Wells, H. G., 1866- ; English novelist.
- Wesley, Charles, 1707-1788; English hymn writer.
- Whitman, Walt, 1819-1892; American poet.
- Whittier, John Greenleaf, 1807-1892; American poet.
- Wilde, Oscar, 1856-1900; English poet.
- Wordsworth, William, 1770-1850; English poet.
- Xenophon, 430-355 B.C.; Greek historian.
- Yeats, W. B., 1865- ; Irish poet.
- Zola, Emile, 1840-1902; French novelist.

CHAPTER XXV

THE FIVE ARTS

Drama—The Films and the Theatre—Painting and Sculpture—Beardsley and Whistler—Rodin—Impressionism—Post-Impressionism—Cubism and Surrealism—Sculpture—Architecture—Victorian Architecture—Edwardian Architecture—Architecture 1918-1939—Furniture and Pottery—Music.

DRAMA

GEORGE BERNARD SHAW'S plays are as good to read as they are to see on the stage. A peculiar characteristic of his dramatic work is the crop of prefaces which he has produced. Some of the most suggestive and interesting criticisms of accepted conventions are to be found in these prefaces. In "The Doctor's Dilemma," for instance, there is a long preface, almost as long as the play itself, criticising the medical profession from many angles. Similarly, the preface to "Getting Married" analyses the existing laws and customs and modes of thought in relation to marriage with a pungent running commentary. Again, in the prefaces to "Man and Superman" and "Major Barbara" we have a whole philosophy of life expounded.

Shaw's plays have been criticised on the ground that in many of them action is subordinated to dialogue, but the latter is frequently so brilliant, witty, stimulating and full of ideas that the absence of dramatic action is not noticed. It is an undoubted fact, however, that practically all Mr. Shaw's plays are vehicles for the propaganda of ideas, and, no doubt, at times artistic ideals are sacrificed.

His dramatic works consist of "Plays, Pleasant and

Unpleasant," "Three Plays for Puritans," "John Bull's Other Island," "The Doctor's Dilemma," "Major Barbara," "Man and Superman," "Heartbreak House," "Back to Methuselah," "Saint Joan," "Getting Married," "Arms and the Man," "Androcles and the Lion," "The Apple Cart," "Too True to be Good" and "On the Rocks."

In addition to the above, Mr. Shaw has written a number of sociological works, including "The Intelligent Woman's Guide to Socialism, Capitalism, Fascism and Communism."

Noel Coward has written plays, revues and operettas, in some of which he has written the music as well as the lyrics and sketches. There is a satirical strain in all his work, in which he tilts at the failings of modern society. He has also acted with conspicuous success in his own plays, which include "The Young Idea," "The Vortex," "Easy Virtue," "Private Lives," "Hay Fever," "Cavalcade." The last is an historical pageant and achieved an unprecedented success. Another play of his, called "Design for Living," was first presented in New York, where his popularity is as great as it is in England.

Some of his best-known revues and operettas are "On with the Dance," "This Year of Grace," "Words and Music" and "Bitter Sweet."

John Drinkwater, the dramatist, who was also a distinguished writer, produced a play entitled "Abraham Lincoln," which at once raised him to fame. Other successful historical dramas written by him are "Oliver Cromwell," "Robert E. Lee" and "Mary Stuart."

He also wrote critical studies of William Morris, Swinburne and Byron, and published volumes of poems.

Sir James Barrie was responsible for a series of imaginative and whimsical plays which made him famous. There is a charming light touch about all his work, although the criticism of sentimentality has been levelled against some of it. His best-known plays are "Peter

Pan," "The Admirable Crichton," "A Kiss for Cinderella," "Dear Brutus" and "Mary Rose."

He also wrote a number of fanciful works of fiction, among which the best known are: "A Window in Thrums," "My Lady Nicotine" and "The Little Minister."

Besides the above, other successful dramatists of recent times are *Ian Hay*, *A. A. Milne*, *Laurence Housman* and *St. John Ervine*. The dramatic works of Somerset Maugham have been dealt with under another heading.

THE FILMS AND THE THEATRE

One frequently hears to-day discussions concerning the relative merits of the *Film and Theatre*. Some people take the view that the tendency of the film to oust the stage is bad for dramatic art. They feel that when the actual living presence is removed, something is lost which the films do not replace. The picture, they say, is based upon an illusion. It is true that the illusion is effective, especially with modern film technique, but, they contend, it is none the less an illusion. They point out that when a living person walks into the room, and shakes you by the hand, and converses with you, there is here a vital contact; the actual meeting between the two persons is a living thing, and something is actually added to life thereby.

This argument cannot be lightly dismissed. Because of these things it is unlikely that the films will ever entirely oust the stage performances so long as there is a demand for the highest forms of dramatic art. In a state of society where artistic values received their due share of public appreciation, it is improbable that such a change could take place.

This does not mean that the films are not capable of high artistic achievement. They undoubtedly are. After making allowance for the absence of that vital personal contact which is probably the chief claim of the

stage to be allowed to survive alongside the films, the films have far greater resources for the production of a great variety of dramatic effect than stage productions.

The resources of the film producer in the matter of scenic effect, for instance, are nowadays almost unlimited. It has undoubtedly added greatly to our enjoyment of life that we are able to be entertained by human drama in surroundings ranging from the Wild Rockies to the teeming streets of New York, and from the cities of the Orient to Trafalgar Square. Again, why should we be deprived of the thrill of being carried along with the actors in a fast-moving pullman express or in an aeroplane above the clouds, or a liner breasting the Atlantic rollers?

One of the great advantages the films possess over the stage is in the greater opportunities which they offer for the obtaining of technical perfection in the action. It will be noticed that in the best American films, however numerous the actors may be, and however small the parts which many of them have to play, these are done to perfection. The reason is that an indefinite number of trial rehearsals are held before the producers decide to produce the film. The actors are compelled to go on practising until they arrive as near technical perfection as possible, and when they attain this the reel on which it is recorded is adopted, and there is no chance of failure through lack of zeal or ill-health or any other cause.

Although the film has greatly extended the range of dramatic art, to allow stage acting to disappear would be a disaster. It is to be hoped therefore that the latter will be preserved as an expression of the highest forms of drama.

PAINTING AND SCULPTURE

Since the 'nineties, certain definite movements have taken place in painting, which have been the result of experiments by modern painters. These movements have been partly in the nature of revolts against

tradition, and partly new developments based on traditional practice.

Among these movements, the most prominent have been Impressionism, Post-Impressionism, Cubism, Futurism and Surrealism.

BEARDSLEY AND WHISTLER

The most striking name in British art in the 'nineties was *Aubrey Beardsley*, whose name is associated with a periodical called "The Yellow Book." His illustrations to the opera "Salome" had made him famous on the Continent, although they offended the still puritanical Victorian taste prevailing at that time in London. This artist is famous, and probably will remain so, because of the beauty of his lines, and the intricacy and richness of his decorative work. They are particularly adapted to certain types of book illustrations. He was primarily a designer and pattern maker, and he did more to advance the art of black-and-white illustration than anyone had done since the sixteenth century.

Whistler was one of the forerunners of Impressionism, and he took the view that, providing a picture had a pleasing effect upon an artistic spectator, it had achieved its object. One of his most famous pictures is the portrait of his mother; another is *Nocturne in Blue and Silver*. In addition to his influence on the art of picture painting, Whistler did much to kill the florid Victorian ideas of decoration, and we owe a considerable debt to him for initiating the movement which has led to the modern styles of interior decoration, with their freedom from heavy, floral patterns, and their tendency towards self-colouring.

RODIN

In the realm of sculpture, the greatest figure at the end of last century, and the beginning of the present, was *Rodin*, whose rugged and forceful methods, and whose con-

centration upon the idea, regardless of conventional traditions, paved the way for the complete overthrow of the smooth, artificial conventionalism of the Victorian artists.

IMPRESSIONISM

We have indicated that the pioneer of *Impressionism* in this country was Whistler. It was in France, however, that the movement gathered greatest force, in the hands of *Manet*, *Monet*, *Pissarro*, *Degas* and *Renoir*. When the works of these masters were introduced into London, they were a revelation. It seemed as though a new world of colour had been brought into being, and the influence on English painting was profound.

It is perhaps as well to mention here that a French school which preceded the Impressionists, and had towards the middle of the nineteenth century exercised a great influence on European art, was the *Barbizon School*, of which the chief exponents were *Corot*, *Daubigny*, *Rousseau* and *Diaz*.

Among the English artists who achieved fame during the first decade of the century, one should mention *Sargent*, whose portraits were remarkable, and considered at that time to be daring in technique. He was undoubtedly a pioneer, and had a great influence in helping modern British painting to free itself from its Victorian shackles. With him may be bracketed, as a great influence in the same direction, *Sir William Orpen*, with his brilliant portraiture, *William Strang*, who was influenced by *Manet*, and *Augustus John*.

Among the other distinguished painters who emerged at this time were *Sir George Clausen*, whose striking lines and fresh colour achieved great beauty, and again gave a great stimulus to English painting. No mention of the leading artists who began to come to the fore at this period would be complete without a reference to *Rothenstein*, *Brangwyn*, *Muirhead Bone* and *Sickert*, who founded the *Camden Town Group*.

POST-IMPRESSIONISM

In 1910 a group of painters who were dubbed *Post-Impressionists* burst upon London. These were French painters, and the most famous names among them are *Cézanne*, *Gauguin*, *Van Gogh* and *Matisse*. Their exhibition caused a great sensation. Much of the work appeared to unaccustomed eyes to be crude, but the exceedingly powerful colour work of this school carried the day.

CUBISM AND SURREALISM

About this time also the *Cubists* began to come into prominence. The purpose of this school was to emphasise the æsthetic values of cubic forms, angles and solids generally. Contemporary offspring is *Surrealism*. In view of the prominence which the latter school has achieved in recent times the rules laid down by the original Futurists are interesting. They aimed at abolishing imitation in any shape or form. Originality above all things must be aimed at, and the "tyranny" of harmony and good taste must be overthrown. Furthermore, art critics must be entirely disregarded. The past was to be completely ignored as though it did not exist. Swiftiness, pride, feverish activity and steely hardness were to be the watchwords. If they were called madmen by those who admired the artistic works of the past, they were to consider that an honour.

Whether the Surrealists would subscribe to all these articles of faith we do not know. Their art is apparently symbolic, and appears to aim at expressing on canvas a number of unrelated ideas. We have here an attempt at arriving through painting at pure abstraction, which may be compared to a similar movement which exists in music.

SCULPTURE

We have already referred to Rodin, and it is now the turn of the English *Sculptors*, among whom the best known

are *Epstein*, *Dobson*, *Eric Gill* and *Maurice Lambert*, while among the representatives of the latest school of thought are *Barbara Hepworth* and *Alan Durst*.

Dobson's earlier work showed simplicity and directness in the stone carving and sincerity of conception. Some of his best works are *Standing Torso* in Portland stone, and *Reclining Torso* in Parian marble. His recent work seems to be influenced by the latest school of thought, and he appears to be giving more attention to "volumes," etc., than to beauty in the Greek sense of the term.

What has been said about Dobson to some extent also applies to Epstein, who is capable of strong and subtle modelling, but adopts forms which it is difficult for the mind brought up in the English tradition to appreciate. Among his most famous works, which have caused much controversy, are the *Oscar Wilde Memorial*, the *Christ*, *Rima*, and his *Day and Night* on the new offices of the Underground at St. James's Park.

There are certain things that it is necessary to remember about Epstein when forming an opinion of his work. To begin with, there is a strong Asiatic element in his art—an element which introduces something alien and foreign to our taste, but not necessarily for that reason bad art. Secondly, his work is sharply divided into two elements, portrait and imaginative sculpture. The former shows very fine modelling, and is more congenial to the English taste. The latter contains an idea that Epstein is striving to express. No one can deny the power of his work, even though it may fail to impress many people with the idea of beauty.

Eric Gill is a refined and polished craftsman, and his *Stations of the Cross* in Westminster Cathedral justly aroused attention and admiration. Other artists whose work stands out at the present time are *Stanley Spencer*, who is capable of very fine drawing and modelling, especially in panel work; *Frank Brangwyn*, *Nevinson*, *Paul* and *John Nash*, and, in the last generation, *Max Beerbohm*.

ARCHITECTURE

We cannot appreciate the significance of contemporary developments in architecture without some knowledge of what has gone before. Until quite recently what are known as Queen Anne buildings predominated in London. This style involves rather heavy massing of buildings with a good deal of classical detail. Red brick is the fundamental material with red terra-cotta in the trimmings. Red tiles were favoured, and high gables, with scrolls and pediments. Another important feature in *Queen Anne Architecture* was the chimney stacks. These are very large and very numerous. The architect who did most to promote this style was *Norman Shaw*.

VICTORIAN ARCHITECTURE

This leads us to the consideration of *Victorian Architecture* generally, and the immediate predecessor of the modern style. This is well represented in Knightsbridge and South Kensington, where late Victorian architecture is represented in the Victoria and Albert Museum, of which the north, south and square courts were designed by *Sir Aston Webb*. Then there is the Natural History Museum, of which *Alfred Waterhouse* was the architect, and everyone who is familiar with the outside of this building will remember how brick and terra-cotta are extensively used, showing the influence of the Queen Anne style.

EDWARDIAN ARCHITECTURE

In the same part of London is a prominent specimen of *Edwardian Architecture*, the Imperial Institute, and nearby is the well-known Royal Albert Hall, a typical piece of colossal Victorianism. All these Victorian public buildings bear the mark of the heavy self-satisfaction of England's century of peace and plenty for the rich, and naval, military and commercial domination abroad.

With the passing of the Victorian age a new spirit began

to show itself in architecture. This particular form of art has always shown itself sensitive to the spirit of the age. The reign of Edward VII was one of transition. With the advent to the throne of that genial monarch, a new spirit of gaiety spread itself through all classes of society. But there was also another spirit abroad, the spirit of unrest, and the dim foreshadowings of the tremendous changes that were about to sweep across the world.

During this period, many fine new churches were built in the modern style with beautiful ceilings and altars, culminating in the two greatest achievements of modern church architecture, the cathedral of Liverpool and the Roman Catholic Cathedral of Westminster. About this time also began the *Garden City Movement*, and an entirely new style of domestic architecture began to develop. It was the dawn of the modern labour-saving house. *Sir Edwin Lutyens* was possibly the most famous architect of this period, and not only of this period indeed, but of the post-war period as well, for it was he who designed the Cenotaph. No one has had a greater, if so great an influence on the domestic architecture of this century, and his work is to be seen in all parts of the country in the larger type of domestic residence.

ARCHITECTURE (1918-1939)

Architecture between the two world wars has been kept busy with war memorials, with town planning, and with the building of great commercial structures, colossal blocks of flats for residential purposes, and with churches and municipal buildings. Undoubtedly all this building shows the mark of transition from the five centuries, and their aristocratic and individualistic tradition, which ended with the First World War. The architecture which we are now witnessing foreshadows what has been called the *Neo-technic age*; the age where big business in alliance with the technique of science rules the world.

This age was already in full swing in America before the First World War, and it is because we, ourselves, since that tremendous social earthquake, are plunging right into it, that so much in our modern life, and hence our modern architecture, bears a strong imprint of America. It is not so much that we are being influenced by America, as that we are rapidly moving in the direction in which she has been moving since the beginning of the century. One has not far to go in London to realise how new this architecture is, how great is the cleavage between it and that of the last generation. One has only to look at the Shell-Mex House on the Victoria Embankment, at Hay's Wharf on the bank of the Thames near London Bridge, on the new offices of the "Daily Express" in Fleet Street, and the huge mountains of flats that are springing up on the site of the vanished slums of Westminster, to realise this fact.

FURNITURE AND POTTERY

High among the contributions made by the Past to the enjoyment of the Present have been the achievements of craftsmen in the arts of furniture and pottery. Throughout the civilised world beautiful specimens of the creations of past artists in these spheres are to be seen in the Museums. The opportunities in London, for instance, of cultivating one's æsthetic taste in this direction are very great, and the study of styles in Furniture and Pottery is one of the easiest and pleasant ways of cultivating the æsthetic faculty.

Specimens of Chippendale, Sheraton, Jacobean, Tudor, Queen Anne, Stuart, Gothic, Adam, Anglo-Dutch, Hepplewhite, Boule, Louis-Quatorze, Louis-Quinze, Regency styles may be seen at the Wallace Collection, the Victoria and Albert and other Museums. The same is true of the great styles of Pottery and Porcelain such as Wedgwood, Dresden, Delft, Majolica, Jasper, Sèvres, Crown Derby, Worcester, Spode.



(E.N.A.)

The Parthenon : the most famous building of classical antiquity. Contrast with the picture below.



(E.N.A.)

Salisbury Cathedral: A great example of Early English architecture (Gothic).



(E.N.A.)

Blenheim Palace: A typical example of late seventeenth- and early eighteenth-century palace architecture.



(E.N.A.)

A modern factory: Notice the lack of decoration in contrast with Blenheim Palace.



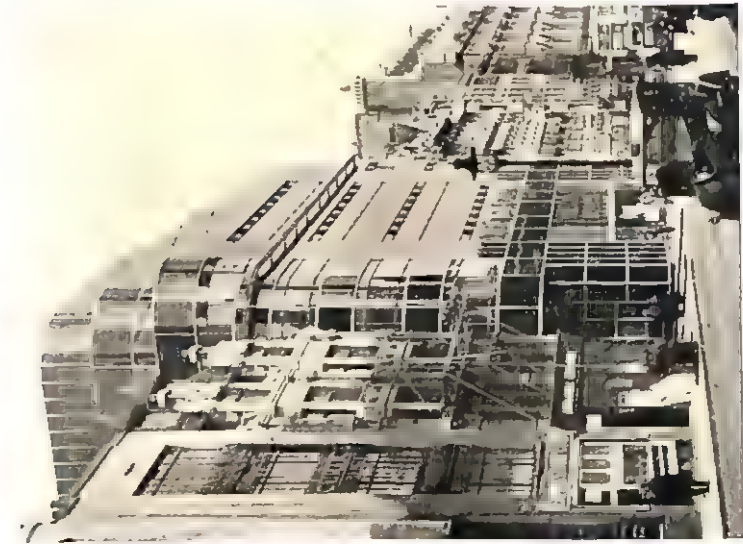
(E.N.A.)

An ultra-modern secondary school.



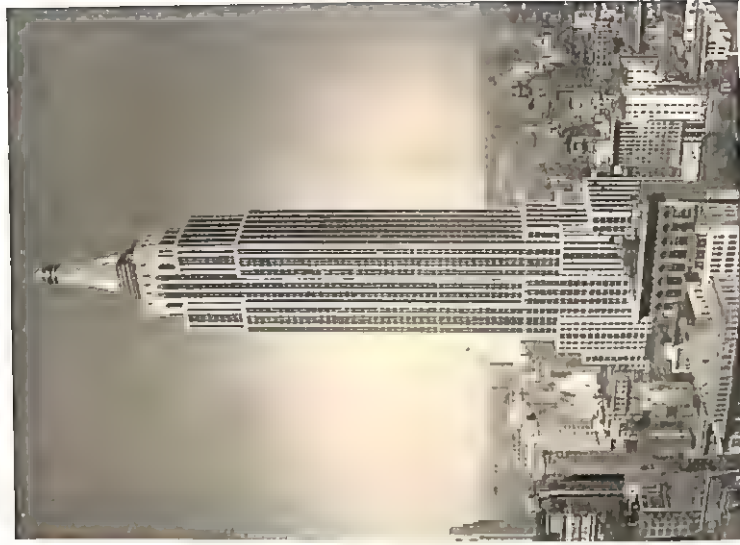
(E.N.A.)

A modern elementary school. Notice the concentration upon lighting.



(E.N.A.)

A striking example of modern office building.



(E.N.A.)

The Empire State Building, New York.

The student is advised to see these collections and make his own observations and comparisons. The Bibliography should be consulted.

MUSIC

Music as we know it is only about 1,300 years old, and there is little music in general use older than 300 years. Palestrina (Italian) and Byrd (English) and their contemporaries are the earliest composers whose music is now performed except by specialists. First of all came the singing of a single melody, that is unison singing. Then came two-part singing, in the seventh century; but the tunes were separated by five notes throughout, the reason for this device probably being that the tenor voice is separated from the bass, and the soprano from the alto, by roughly five notes. The effect of such an arbitrary arrangement is frequently unpleasant, and so pleasant relationships between notes sung together were sought for. That is the basis of harmony. It was not until the sixteenth century, however, that composers had established the craft of writing parts in harmony.

The next great step forward came with Purcell (English), Bach and Handel (German), Scarlatti (Italian) and Couperin (French), who added to the harmonic conception the idea of counterpoint, that is, different tunes (and not merely one tune and accompanying parts) moving together in harmony. Thus far instrumental accompaniment had been either omitted altogether or kept simple. It now became more elaborate, but the basis of the orchestra was still a keyboard instrument—harpsichord or organ.

Instrumental music was subject to conditions quite different from those of vocal music. The men who wrote the English unaccompanied madrigals, however, laid the foundations for the later instrumental music of Bach, Mozart and Beethoven. It was the early habit of com-

posers for instruments to seek for variety by playing consecutively two contrasted tunes. Out of this came the suite of pieces (usually dances). Next the suite was studied for the sake of ensuring variety of key and of musical material, and thus the suite was succeeded by the Sonata. That term is commonly employed to describe a piece of music in three or four movements or sections for a single instrument, or two instruments. The Symphony (orchestra), String Quartet and Concerto (solo instrument and orchestra) are all sonatas, so to speak, for different musical combinations. Haydn and Mozart (Austrian) were the first great composers of music in Sonata form, and they were followed by Beethoven who brought it to perfection. With them the orchestra as we know it was established, and the domination of a keyboard instrument was ended. Theirs was the classical school.

The romantic movement which swept the other arts made also a deep impression on music. Classical forms were still respected, but poetic or extra-musical meanings were superimposed upon them. The great romantic composers were Weber, Schumann, Mendelssohn, Liszt, Wagner in Germany; Chopin in Poland; Berlioz in France. This development resulted in larger orchestras and more elaborate scoring for the instruments.

Simultaneously with these classical and romantic developments, opera was transformed. Hitherto opera had been much more musical than dramatic: it now became a more reasonably balanced art-form, reaching its greatest heights of elaboration in the hands of Wagner.

The impressionist movement in painting produced a parallel school of music. Debussy (French) was the greatest exponent of impressionism in music.

Before we come to the modernist school, it is important to note that certain great composers belong to more than one "period" or school. Edward Elgar (English) and Brahms (German) were certainly romantics, but they

may be defined also as classicists and modernists. In some measure that is true also of Richard Strauss (German).

The modern school stands for complete freedom, harmonically, melodically and formally. Among its leading lights are Scriabin (Russian), Stravinsky (Russian), Schönberg (Austrian), Bartok (Hungarian), Holst (English), and William Walton (English).

Whether music is necessarily national or not is endlessly debated. Without seeking to answer the question we may note that certain composers are deliberately national or racial in their music. This is true, for instance, of Smetana (Bohemian); Glinka, Balakirev, Rimsky-Korsakov and Tchaikovsky (Russian); Albeniz, Granados and Falla (Spanish); and Vaughan Williams (English). Into this list also might go the name of Sibelius (Finnish) except that he disavows *deliberate* intention to write music with a national or racial message.

EXAMINATION QUESTIONS

1. Describe the dance music and dance bands of the present day and point out how they differ from those of twenty years ago.

2. Give some account of a writer or musical composer who has produced during the post-war period work which is likely, in your opinion, to be of permanent value.

3. Give an account of the characteristics of any well-known school of British painters.

4. Give some account of the changes in house furniture and decorations during the last forty years or so.

5. Write a brief account of the work of any *two* of the following :

Charles Darwin, John Drinkwater, Alexander Korda, John Masefield, Gilbert Murray, Lord Rutherford, Hugh Walpole.

6. Do you consider that the development of wireless helps or hinders true musical appreciation? Give reasons for your view.

7. Account for the prevailing interest in biography and memoirs and describe the noteworthy features of any biography of recent years.

8. Choose *one* of the following and say what you find most interesting in his work:

H. G. Wells, George Bernard Shaw, John Galsworthy, Thomas Hardy.

9. Write an appreciation of the work of *one* of the following: Arnold Bennett, Elgar, Epstein, Galsworthy, Augustus John.

10. State which one of the following types of literature you most enjoy, giving your reasons and illustrating your answer by reference to one particular book: novels; books of travel; biographies.

11. What features do you expect to find in good choral singing?

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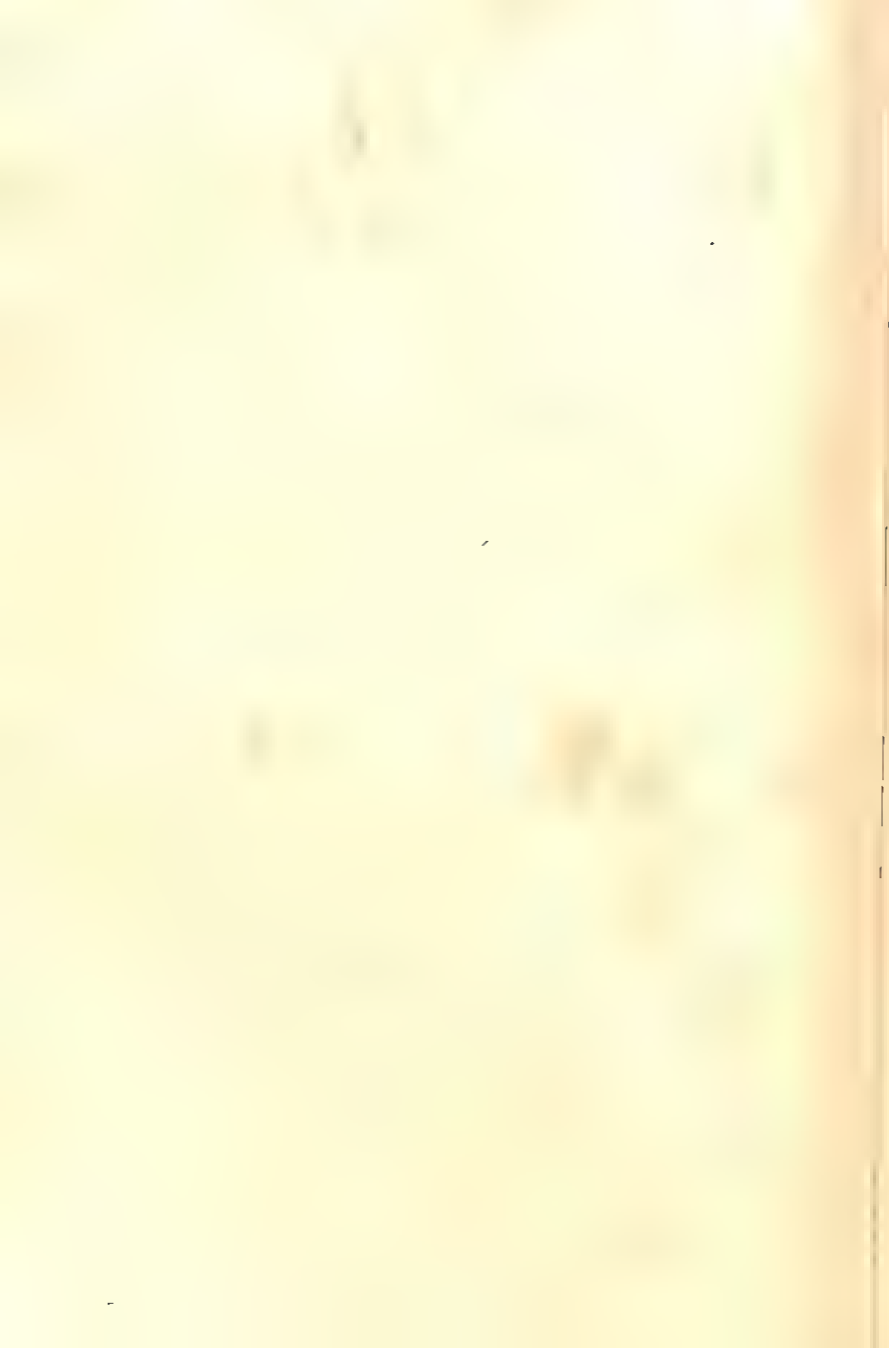
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PART VI

MISCELLANY

*(Notes 'on Miscellaneous Subjects on which Questions are set,
with Examinations)*



CHAPTER XXVI

EMINENT MEN AND IMPORTANT SUBJECTS

Famous Men—The Decline of Population—Daylight Saving—Summer-time—Atoms—Women's Careers—Insectivorous Plants—The Influence of American Speech upon English—Conclusion.

FAMOUS MEN

Winston Churchill is so famous, that it would be impertinent to assume that any student is not thoroughly acquainted with his achievements as Prime Minister of Great Britain during the Second World War. He has been a dominant figure in British politics ever since he joined Mr. Asquith's Government before the First World War.

Major Clement Attlee, Prime Minister of Great Britain since the General Election of July 1945, when the Labour Party was elected with an overwhelming majority.

President Roosevelt was famous many years before the Second World War as President of the U.S.A. No President since Abraham Lincoln has dominated the American political stage to such an extent. His greatest achievements in internal affairs were associated with the "New Deal," which introduced reforms of a far-reaching and beneficent character in the social and economic life of the U.S.A. He shared with *Winston Churchill* and *Marshal Stalin* the leadership of the world in the victorious war against the iniquitous conspiracy of the German Nazis and their Italian and Japanese confederates to secure the domination of the world.

Marshal Stalin, leader of the U.S.S.R., whose great schemes of social and economic reconstruction during the period between the two world wars were embodied in their

five-year plans. His name is, of course, a household word throughout the world as a great statesman and military leader in Russia's war against, and subsequent brilliant victories over, the German invader.

Generalissimo Chiang Kai-shek is well known as President of the Chinese Republic and military leader of the Chinese central and southern armies against the Japanese invaders.

President Truman, became President of the U.S.A. on the death of Roosevelt.

General de Gaulle became famous as leader of the Free French Army and Navy during the Second World War. A distinguished soldier and patriot.

Marshal Tito, military and political leader of the Yugoslav resistance. Undoubtedly a military genius and the dominant figure in South-Eastern Europe at the present time.

Earl Balfour was one of the most distinguished statesmen of the present century. A member of the ancient and aristocratic Cecil family, he entered politics early in life. He devoted the whole of his career to Parliament and held a variety of offices under the Crown. His first important appointment was that of Chief Secretary for Ireland in 1887. He held this office during an exceedingly difficult period and achieved great distinction. He became Prime Minister in 1902, and went out of office in 1906, when the Liberal Party gained an overwhelming victory. He returned to the Government during the war, and continued his public services until within a few years of his death in 1930.

Sir Oliver Lodge was one of the most famous British scientists of modern times. His principal scientific work has been in connexion with electricity and atomic science. He has done much good work in educating the public mind in scientific matters through his popular scientific works. He has also shown himself keenly interested in psychical research.

Lord Birkenhead was originally Mr. F. E. Smith, and

made one of the ablest maiden speeches ever uttered in the House of Commons. He was a member of the Bar, and as King's Counsel his success was phenomenal. It is generally recognised that he was not only a great orator, but a great lawyer and a great statesman. He held the offices of Secretary of State for India and Lord Chancellor, and was a member of the War Cabinet. Two of his greatest achievements were the manner in which he discharged his office as Lord Chancellor (Head of the Judiciary), and his conduct of the negotiations which preceded the Irish settlement.

Marshal Foch was Commander-in-Chief of the Allied Armies during the last phase of the Great War. He was first distinguished for the part he played in the battle of the Marne in 1914, through the defeat he inflicted upon the Germans in the marshes of Saint Gond. His masterly strategy in 1918 resulted in the complete defeat of the German Armies.

Marshal Lyautey distinguished himself in the First World War, then commanded the French armies against the Riffs in Morocco, and subsequently completed the pacification and consolidation of the French Empire in Morocco. He was one of the greatest colonial administrators of modern times.

Mr. Lloyd George is best known to the present generation for his leadership of the country during the First World War, and the four years which followed it. This statesman began his career as a Radical. One of his most prominent appearances in public life during the earlier part of his career was his campaign of speeches opposing the Boer War. He next rose to prominence for his attack upon the House of Lords, and there is very little doubt that he strongly influenced the decision to curtail the powers of that House, which was embodied in the Parliament Act. This Act deprived the Lords of the power to throw out a Bill containing financial provisions which had been passed by the House of Commons.

This statesman was also rendered famous in pre-war days for the introduction of what were then considered revolutionary reforms in national finance. These were incorporated in his budget of 1909. He further increased his title to fame by his introduction of National Health and Unemployment Insurance in 1911. He was jointly responsible with President Wilson and Clemenceau and Poincaré for the Treaty of Versailles. Most people will admit, however much they may differ from him on certain political issues, that his leadership of the country during the First World War, and his introduction of social reforms before the war, which are now accepted as necessary elements of the national life, will mark him as one of the most famous figures in English history.

The above names are quoted purely by way of illustration. The student should make it his business to become acquainted with the names of people who are, or have been, in recent times eminent in the various spheres of human achievement. The questions and Bibliography at the end of Part VI should also be referred to in this connexion.

The Second World War has brought many new subjects into the field of attention of the student of General Knowledge. Certain events and persons stand out, and it is upon some of these that it is now desired to focus the attention of the student. This book is not an encyclopædia, and we do not propose to do more than advise the reader to make himself acquainted with the nature and significance of the following :

Here are some important place names : Stalingrad, Dniepropetrovsk, Kharkhov, Kiev, Leningrad, Pripet Marshes, Budapest, Caen, Falaise, Cherbourg, Niemegen, Arnhem, Bastogne, El Alamein, Tobruk, Benghazi, Tripoli, Tunis, Oran, Salerno, Anzio, Cassino, Pearl Harbour, Manila, Okinawa, Hiroshima, Nagasaki, Bhamo, Laschio, Chindwin.

The following are the names of prominent Public Men

including soldiers and statesmen: Winston Churchill, Roosevelt, Truman, Attlee, Stalin, Molotov, Montgomery, Alexander, Air-Marshal Tedder, Air-Marshal Leigh-Mallory, Bomber Harris, Doolittle, Admiral Mountbatten, Admiral Bruce Fraser, Admiral Harwood, Admiral Cunningham, Ernest Bevin, De Gaulle, Marshal Tito, Marshals Zukhov, Rokosovsky and Koniev; Generals Eisenhower, Patton, MacArthur, Wainwright; and Admiral Nimitz, Cordell Hull, Stettinius, Stafford Cripps, Hugh Dalton, Herbert Morrison, Aneurin Bevan, Lord Wavell, Sir John Anderson, Chiang Kai-shek, Ghandi, Nehru, Pius XII.

The student should also be in a position to give an intelligent account of the following: The Atomic Bomb, the Flying Bomb, the Rocket, Mulberry, the Bailey Bridge, Pluto, Fido, Radar; Dumbarton Oaks, Bretton Woods, San Francisco, Teheran, Yalta and Potsdam Conferences, the Atlantic Charter, the Big Three, the Big Five, the Beveridge Plan, the Uthwaite Report, the Education Act of 1944, Penicillin.

THE DECLINE OF POPULATION

Two opposing factors are at work affecting the population. One is the *Decline in the Birth-rate*, which, of course, makes for decrease in the future, and the other is the *Increase in the Average Length of Life*, which operates in the opposite direction. One effect of these two tendencies is to increase the ratio of older people to younger people at any given time.

The decrease in the birth-rate is due to several causes. The professional and middle classes are tending to marry later in life, and, owing to the much higher standard of living, and the greater demand for luxury and entertainment, there is a tendency to restrict families. This latter factor is beginning to operate among the working classes also.

During the nineteenth century, and particularly during

the first half, a large family was reckoned by the working classes as an asset, because they could send children to work, however young they were, and so increase the family income. They are now prohibited by law from doing this, and, furthermore, the raising of the school age causes the children to be a drain on the family resources for a much longer period. There may be, but we do not know that there is, some unknown biological reason for the decline of the birth-rate.

The increase in the average length of life of individuals is due to a number of causes, among which the most important probably are the great advances in the growth of medical science, as well as sanitation, the shorter hours of labour and the vastly improved conditions under which work is performed.

The effect of the declining birth-rate, coupled with the increase in the length of life, will tend to perpetuate the higher ratio of old people to young people, and will bring certain social problems in its train, as, for instance, a permanent increase in the expense of providing for people when they have passed the normal age for earning their living. This, however, will probably be set off by the fact that, as time goes on and there are fewer young people available for work, and the age of fitness for work goes up, people will keep on working until a more advanced age than they have been doing hitherto. It may be found that the provision which is at present being made for the social services is considerably in excess of future requirements; and the same will probably apply to housing, although for many years to come this will be set off by the building which will have to be done to effect slum clearance.

It is contended by some that a decline in population, as compared with other nations, will weaken this country relatively. If power were relative to population, Great Britain would hold a negligible place among the nations of the world. The populations over which she rules

exceed 300 millions, yet her own population is only about 40 millions. The notion that a large population spells power is probably based upon a fallacy derived from the state of affairs in the world which preceded the revolution in technical methods of production, which in turn was brought about by the advance of science during the last century. It is extremely doubtful whether large land armies will be of any value should there be another war. It is generally accepted that future conflicts, if any, will be decided by atomic bombs and rockets. It is much more probable that power in the future will go to wealth and high scientific efficiency, and the possession of wealth is unquestionably necessary for the production of high scientific efficiency.

Large populations again are no longer as essential as they used to be to the production of goods. More and more scientific progress reduces the need for human labour. In fact, it might be argued that in the future a large population will be a liability rather than an asset, because of the necessity of providing for an increasing number of people for whom work cannot be found.

DAYLIGHT SAVING

The originator of Daylight Saving was *Mr. William Willett*, who did not live to see it put into effect. In 1916, it was decreed by Parliament that all clocks in the United Kingdom should be advanced by one hour in the summer-time. This measure was introduced as an expedient in war-time for economising the fuel used in the production of artificial light. Nowadays we regard this as part of the normal state of affairs. We are, however, a conservative nation, and it is doubtful whether, if this innovation had not been imposed by the necessity of war, it would have been adopted at all.

Once, however, it had been adopted it was found so advantageous that it was continued permanently. It

was found that the daylight saved for the purposes of war was equally useful in peace-time. People in the towns benefited greatly by the additional opportunities afforded for healthy outdoor pursuits in their leisure time. The country-side, however, did not adapt itself quite so readily. Country folk had for thousands of years been accustomed to adapt themselves to nature's timetable, and resented this new-fangled scheme for interfering with time-honoured arrangements. In Scotland, again, daylight saving did not find general acceptance because in the north in the summer-time nature saves her own daylight. However, in the interest of the community as a whole, even those who demurred conformed.

SUMMER-TIME

The critics of the introduction of Summer-time point out that the necessity of introducing such a device indicated a serious weakness in our characters. Governments, however, are compelled to be practical, and to have due regard for human weaknesses. They know, by hard experience, how difficult it is to alter a long-established custom. We are accustomed to our breakfast at a certain time by the clock, and, wherever the sun may be, we are not going to alter that. We will alter the clock, but we won't alter the time of our breakfast. But, apart from this, in a highly complicated civilised society such as our own, there are tremendous advantages to be gained, and great disadvantages to be avoided, by the process of altering the clock instead of getting up an hour earlier without altering the clock. It would, for instance, be necessary to change all the bus and train time-tables, and to change office hours. Think of the printing and clerical work, etc., involved in the former, and the alteration of brass plates, and other types of notices, in the latter. These are only two examples of the disorganisation and chaos which would result from an attempt to gain this end by different means.

Possibly the strongest argument against summer-time lies in the difficulty of bringing our own practice into line with that of other countries. Thus, when in 1925 it was decided by the Government to fix permanently for the future the dates for the beginning and ending of summer-time, it was careful to secure agreements in advance with our Continental neighbours. These agreements have not always proved effective, and occasionally a gap has appeared between the date of the introduction of our summer-time and that of our Continental friends. The effect upon the cross-Channel services was to cause an inconvenient temporary dislocation. The disadvantages of Daylight Saving, however, are far outweighed by the advantages. This is a sphere in which the League of Nations can, and will no doubt in the future, render valuable help.

WOMEN'S CAREERS

In 1938, 14,000 women were employed in banks, about 80,000 in Government departments, and thousands in railway and insurance offices, and in other occupations such as designers in aeroplane factories, sales-managers, advertising managers, buyers, skilled workers in wireless, electrical, rubber and automobile factories, etc., etc. These numbers have been increased out of all proportion during the Second World War.

The sphere in which the incursion of women has been revolutionary is the City, where a number of women now hold responsible positions. Even the Stock Exchange has a few women employed on the staff of its members. In the sphere of insurance, women managers and inspectors have been appointed to handle insurance work among women clients, and there are a few women insurance brokers. Women graduates are employed in the statistical departments of some of the big investment trusts.

They have found their way into merchant shipping, where women graduates in languages do duty as confiden-

tial cable clerks at home and abroad, while in Mincing Lane they are to be found among the experts of the tea market. It would be possible to multiply the instances almost indefinitely where women are carving out careers for themselves in business. When we consider the professions, we find the same process going on. In this sphere competition is keener. There are fewer salaried appointments open to women. In accountancy and architecture, the ratio of men to women is 50 to 1. In librarianship, on the other hand, women outnumber men.

There is also the Civil Service, where a variety of posts to be entered through competitive examination are open to women and girls. Among the best-known appointments of this class for which women are eligible are the Executive class, the Clerical class, Writing Assistants, Typists and Clerk-typists, Female Sorters in the Post Office, and, at the top of the tree, the Administrative class. Some of the posts in the Civil Service requiring special training are open to women. Such are the position of Actuary in the Government's Actuaries Department, Examiner in the Estate Duty Office to qualify for which she must pass the Executive examination, and then take her LL.B. If a girl has scientific ability she can enter a Government or Industrial laboratory as an assistant and work her way up, by getting a B.Sc. degree, to higher posts. In this way she may become an expert in research on fuels, building-construction material, metals, forest products, textile products, paints, plant-breeding, and other special lines of research. A woman may also qualify as an Examiner in the Patent Office, or if her science qualifications are in the direction of botany and agriculture, she may qualify as a botanist, naturalist or research officer in one of the Agricultural Experimental stations.

Broadcasting and journalism are spheres in which women have found considerable openings. We have also, of course, women dentists, women doctors, women driving

examiners under the Ministry of Transport and women teachers of domestic science.

In conclusion it can truly be said that to-day women have greater opportunities of earning their own living than at any previous time in history, and that nearly all occupations are now open to them, although, of course, they have to meet competition on equal terms with men.

INSECTIVOROUS PLANTS

The *Sundew* lives in peat-bogs, but it has tastes far above the condition of life in which it finds itself. It likes a varied diet, and has managed to acquire the power to trap little insects in its leaves. It is not narrow in its tastes, and is quite willing to exchange its insect diet for meat or eggs. This has been tested by growing sundew in a saucer of moss and water, and feeding it artificially. It seems to find this to its liking.

A more aristocratic plant coming under this category is the *Pitcher-plant*. Its leaves stand upright, so that water collects at the bottom. The upper part secretes honey which attracts flies, which slide down the slippery inner surface of the pitcher, and are drowned in the water at the bottom. The plant then gradually absorbs them.

The *Venus Fly-trap* has a very remarkable piece of mechanism, involving something like a spring. Its pairs of leaves open like a rat-trap, and when the fly touches the trigger, they snap and hold them.

The *Pinguicula* is a greenhouse plant. Its leaves have a sticky surface, like fly-papers, on which insects get stuck, and are eventually absorbed into, and digested by, the plant.

In addition to the matters already referred to, the student should familiarise himself with the following topics: *Religion ; Questions affecting Women ; War ; Marriage Laws ; Censorship of Plays and Films.*

THE INFLUENCE OF AMERICAN SPEECH
UPON ENGLISH

It is often said that the English language is being corrupted "by the introduction of American words and phrases." The word "Americanism" is used, frequently with a hint of disapproval. The fact is, however, that this invasion is not new, for many words introduced from America into England have become part and parcel of the language, and are used by us as every-day English.

It is a mistake to suppose that English is in any sense a pure language. Ever since the Norman Conquest, nearly 1,000 years ago, foreign words have been flowing into England, mixing freely with, and ultimately amalgamating with, the original Saxon tongue. It would be impossible to write an intelligible sentence of any length in what is called pure English.

Modern English includes terms borrowed from French, Latin, Dutch, Greek, Arabic and Hindustani, as well as American. These are only a few of the foreign importations. Take a word like "pyjama." When you use this homely and common word, you are speaking Persian. I think most people will admit that the word "bluff" is good and descriptive. This comes from America, and was used by the pioneers to describe the bank of a river. Do you object to having "wall-paper" on your walls, because this is an American word? Such words as "antagonise," "worth-while," and "highbrow" are American. They are in free use now and fully admitted to fulfil a useful function in the language.

To understand why the Americans have developed a host of new words and phrases of their own, and also why many of these have great merit, it is necessary to look back to the early days when the first English settlers landed in America. They found themselves in a land full of trees and animals which had never yet been described in the English language, and with several types of

weather which also had not been so described. They found Indians living there, who had their own words for these things, a number of which the settlers appropriated. From this source we have such words as "canoe," "raccoon," "opossum," and "maize." From the same source come "pow-wow" and "mugwump." Strangely enough a number of words of Spanish, French and Dutch origin come to us through America, the reason being that the Spaniards, the Frenchmen and the Dutchmen had been in America before the English settled there. For some time the domination of the North American continent was fought for between the English colonists and these other Europeans. The French were the most formidable opponents, and were the last to be overcome.

In the beginning of the occupation, the colonists were faced with a grim struggle for existence, and most of the words which filtered into the English language from this quarter at this time were nouns describing food and implements, which in time became the subject of trade with Indians; and when these commodities were imported, the words were imported with them. Thus it was that the Indian word "tobacco" came from America.

Before the American War of Independence, the home folk did not worry about the influx of American words; in fact, on the whole they liked them. They enriched the language. But after the War of Independence a bitter feeling prevailed on both sides of the Atlantic. English people who prided themselves upon their literary tastes were shocked when they found themselves using words of American origin, and did their best, usually with complete absence of success, to substitute good old English words.

Similarly, on the other side of the Atlantic, the Colonists, still boiling with indignation at the attempts that had been made by the home country to tyrannise over them, examined their language closely, in order

to eliminate as many English words as possible. They naturally found that they could not do this without ceasing to speak English altogether, and adopting a new language. Some of the wildest patriots did suggest that Algonquin, an Indian dialect, should be adopted in the place of the language of the hated British tyrant.

The result of all this hysteria was in the long run negative. Americanisms continued to find their way into England, and Anglicisms into America. Shortly after the War of Independence, that great American, Thomas Jefferson, gave us the American word "belittle." English travellers imported such words as "to notice," "lengthy," "clever," "to oppose," "to progress." What word seems more thoroughly British than the word "awful," in its modern un-Scriptural sense. Awful though it may seem, this familiar and homely word is an Americanism.

A violent campaign took place in the English Press against these importations, but they failed to keep out words like the following: "census," "immigrant," "schooner," "law-abiding," "express," "boom," "boss"—all of which are now indispensable in our language. The following expressions which are now in common use come from the same source: "once in a while"; "time and again"; "to be on time"; "to clear out"; "to turn down a job"; "to make good"; "to get the hang of something"; "to keep a stiff upper lip"; "to bark up the wrong tree"; "to keep one's eyes peeled"; "to make a bee-line for something."

It has been alleged that the Americans are fond of queer-sounding meaningless words. This, however, is not so. On the contrary, however strange-sounding their words may be us, they nearly always have a precise meaning. We are much more open to the charge of liking words merely for their sound. Take words like "swank," "bally" and "blooming," which are purely British. They have very little more than sound value. Generally

speaking, American words express some vivid occurrence or emotional experience. Take such compound words as "home-spun," "cross-purposes," "fool-proof," "horse-sense" and "a come-down." These are undoubtedly vivid and pregnant with meaning.

The nineteenth century was the great pioneering century of America, when the Americans were finding out what they could do, and the chartering of the continent was indicating to them what occupations they were going to follow. In every walk of American life in the nineteenth century, valuable words and idioms came into being which have been absorbed into the English language, and are in full use in this country to-day.

From the Wild West comes: "to go the whole hog," "to stampede," "to round up," "snag"; and the cowboy has given us a word derived from the Spanish word, "cincha," which means a saddle-girth. The expression referred to is a "cinch." To the cowboy it is essential to be certain that his cinch is fixed, thus something that is certain is described as a "cinch."

The American army has given us "old fogey," which originally applied to a staff-officer, hanging on to his job so as to increase his pension. From the lumber trade comes "log rolling." From the American card game of poker come "square deal" and "four-flusher." American politics have given us "gerrymander," "carpet-bagger," "filibuster," "influence," "wire-pulling," "on the fence" and "bunkum."

The last word is interesting. It is derived from "buncombe." In North Carolina there is a county called Buncombe. More than a hundred years ago, a Congressman, newly elected to represent that county, rose to his feet to make his maiden speech. Unfortunately for him, he rose at a time when most of the members were beginning to trickle out to lunch. The Congress-man was incensed and shouted at them: "All right, if I can't talk for you, I can talk for Buncombe." This phrase was

picked up, and soon passed into general use to describe a duty speech, that is, a speech where it did not matter what the speaker said so long as he continued speaking. So it was that to talk bunkum came to mean to talk nonsense. And now it has had a child in America, and that child is "de-bunk," which means to expose the nonsense in something.

As time went on, America achieved great things in many fields of activity, such as engineering and medicine. Hence came to us the word "anæsthesia," given to us by Oliver Wendell Holmes. From this word, of course, comes the familiar word "anæsthetic."

A few more American words used by famous Englishmen are the following: "to advocate" was a favourite expression of Burke's; Dickens was fond of the word "loafer"; Robert Louis Stevenson made great play with "shyster"; and Earl Baldwin, in a speech to the House of Commons, referred to a "best-seller," a "backslider" and to a party "dog-fight."

The deduction to be drawn from all this is that there is no cleavage between English as used in Great Britain and English as used in the United States of America. They are both the same language, developing and being enriched in two different parts of the world.

CONCLUSION

We have endeavoured to touch upon the most important topics of the day with which intelligent people should be acquainted, and we hope the reader will improve upon such help as we have been able to give him by consulting his daily newspaper, and, during week-ends, reading one good weekly paper, such as "The Spectator," "The New Statesman," "Time and Tide" and "The Times Literary Supplement." The book reviews in the last, or in the "Sunday Times" or "Observer," will enable him to keep himself abreast of current movements, in litera-

ture, science and art. He should also consult his Public Library for important works on the various subjects dealt with in this book.

EXAMINATION QUESTIONS

1. Give a brief survey of the main provisions of the Versailles Treaty (1919), and state how far they have been carried into effect.

2. Give a brief account of the work of *three* of the following:

Toc H, Lloyd's Register of Shipping, the Automobile Association, the Youth Hostels' Association, the British Legion.

3. Write a short account of *one* of the following:

The Oxford Group Movement, the Five-year Plan, "Codex Sinaiticus," President Roosevelt's Recovery Policy.

4. "World-wide economic organisation is the only sure safeguard against war." Discuss this.

5. Give a brief account of the political views of any *two* of the following:

Major Attlee, Mr. Winston Churchill, Lady Violet Bonham-Carter, Mr. Harry Pollitt.

6. In the list of public men who died within the last twenty years are the names of Lord Oxford and Asquith, Earl Lloyd George, Mr. Ramsay MacDonald, Mr. Neville Chamberlain, President Roosevelt, Adolf Hitler, Benito Mussolini, Leon Trotsky, Tojo. Write a brief account of their character and political life.

7. Write an appreciation of the work of *two* of the following:

Madame Curie, Delius, John Galsworthy, William Orpen, Ronald Ross, Jacob Epstein.

8. How far is it true to say that the laws of this country are weighted in favour of women?

9. Describe the semaphore system of signalling. For what purposes is it used?

10. What evidence is there of American influence on our speech? How is that influence exercised?

11. What do you know of the following :

The Iron Lung, I.L.O., The Rome-Berlin Axis, Kemal Ataturk, Benes, Psychiatry, Penicillin, Radar, Pluto, Mulberry, Atlantic Charter, San Francisco Conference, E.R.P., Western Union, Boyd Orr ?

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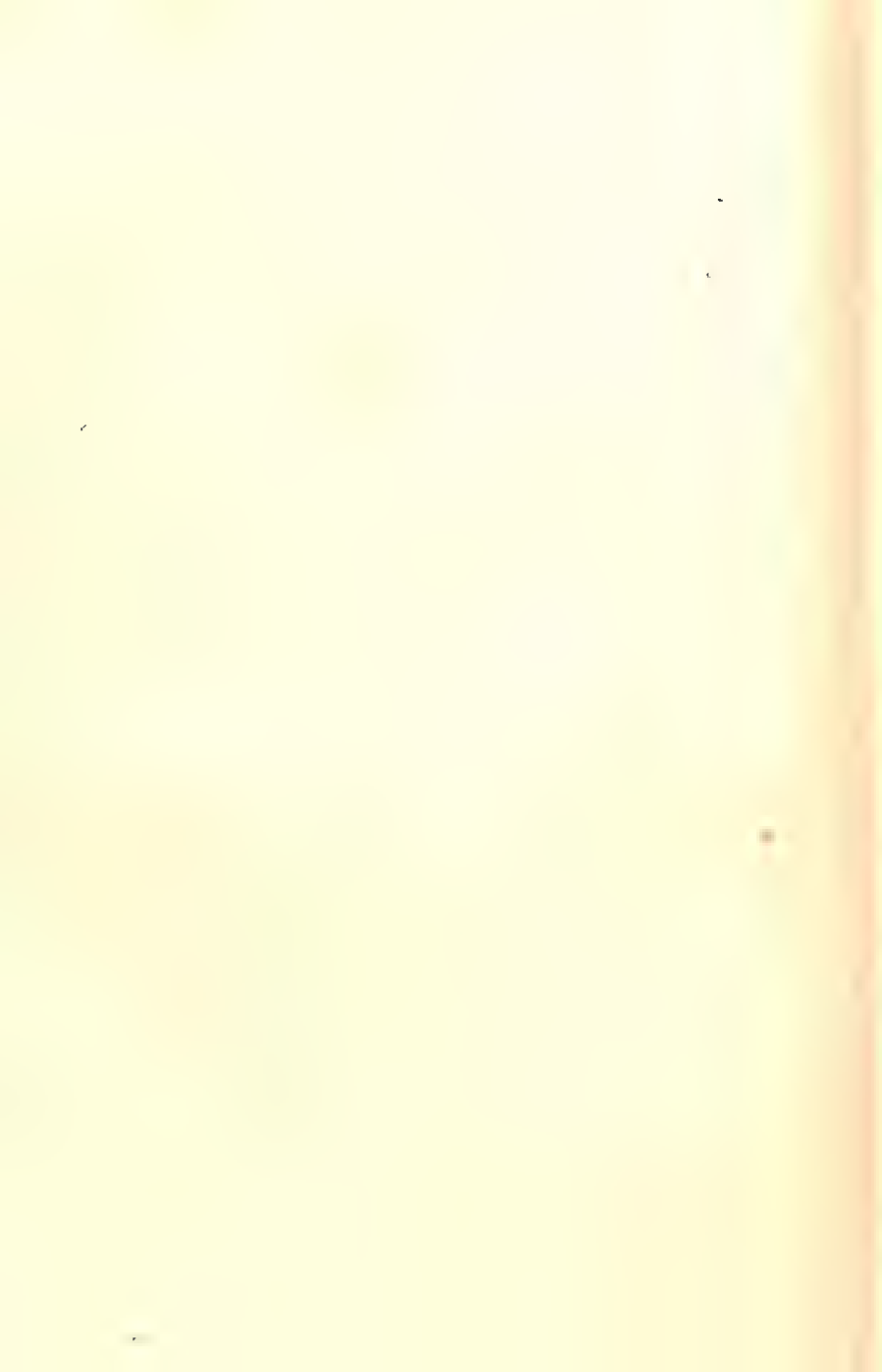
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APPENDICES

I. CIVIL SERVICE PROFESSIONAL AND OTHER EXAMINATIONS AND CAREERS REQUIR- ING GENERAL KNOWLEDGE

II. FOREIGN EXCHANGE



APPENDIX I

CIVIL SERVICE, PROFESSIONAL AND OTHER EXAMINATIONS AND CAREERS REQUIRING GENERAL KNOWLEDGE

CIVIL SERVICE

THE General Executive Class, Executive branches of the Defence Departments, Assistant Examiners in the Estate Duty Office, Assistant Auditors in the Exchequer and Audit Department.

Assistant Inspector of Taxes in the Inland Revenue Department, Junior Assistant Auditor in the Ministry of Health. Officers of Customs and Excise.

Male Assistant Preventive Officers.

The Clerical Class (Minor and Manipulative Grades).

Post Office Clerical Class.

Female Shorthand-Typists and Clerk-Typists.

Colonial Civil Service.

Diplomatic Service.

Consular Service.

The Indian Police Service.

PROFESSIONAL AND OTHER EXAMINATIONS

Navy, Army and Air Force Entrance Examination.

Metropolitan Police Entrance.

L.C.C. Major Establishment.

L.C.C. General Establishment.

Public School and College Entrance Examinations.

Scholarship Examinations.

University Diplomas.

Institute of Municipal Treasurers and Accountants.

Institute of Chartered Accountants.

Society of Incorporated Accountants and Auditors.

The London Association of Certified Accountants.
Association of International Accountants.
Institute of Cost and Works Accountants.
Institute of Civil Engineers.
Institute of Auctioneers and Estate Agents.

CAREERS IN WHICH GENERAL KNOWLEDGE IS
ESSENTIAL TO SUCCESS

Teaching.
Journalism.
Municipal Services.
Secretarial.
Law.
The Churches.
Commerce.
Salesmanship.
Advertising.
Industry and Manufacture.
Insurance.
Banking.
Shipping.
Transport.
Architecture.
Engineering.

APPENDIX II

FOREIGN EXCHANGE

THE term "Foreign Exchange" is very loosely used, but most people are agreed in referring it to the rates at which the currencies of different countries can be purchased. Foreign Exchange means the exchanging between different countries of their currencies; the rates of exchange are the prices of the various national currencies in terms of other national currencies.

Generally speaking, it may be said that the fluctuations of Foreign Exchanges are the reflex of the fluctuations in the balance of indebtedness at different periods between nations.

The following quotation from Goschen's "Theory of the Foreign Exchanges" gives a clear definition of the meaning of this expression:

" . . . As the result of international commerce, a certain portion of the community has become indebted to merchants in foreign countries; and in order to save the trouble, risk, and expense of sending coin, it seeks out another portion of the community to whom a similar amount is owing by the identical foreign countries in question and, buying up those debts, assigns them over in payment to its own foreign creditors. And if the aggregate sums owing by the two countries to each other were absolutely equal—that is to say, equal in amount, coincident as to the period fixed for settlement, and payable, too, in an equal or identical currency—there would be no difficulty of any kind in determining the equivalent which the purchasers of such claims would pay to the sellers. It would simply be a sum equal to, or, rather, identical with, that which is payable abroad under the transferred claims. The amount required by the purchasers being equal to the amount held by the sellers, and required, too, at the same time, there would be no cause in operation to vary the price, and there would be no fluctuations in the rates of the Foreign Exchanges. In technical language, they would always remain at par. But, conversely, we arrive at the point which forms the essence of

the present discussion: the fluctuations which actually take place in the Foreign Exchanges are at once the necessary result and the certain index of the inequalities which exist in the indebtedness of different countries, inequalities either in the amount of their liabilities or in the time within which payment must be made or in the relation of the currency of one country to that of another."

To illustrate this, we will imagine a country called Utopia where the unit of currency is called the Uto, and another country called Arcadia, of the same degree of reality as Utopia, where the unit of currency is called Arc.

There was a time when a traveller from Utopia could obtain 20 Arcs for 1 Uto in Arcadia. Now, alas, the Utopian can only obtain 9 Arcs for his Uto. What has happened to cause the fall of the value of the Uto in relation to the Arc?

In the year A.D. 2000 when the Uto was worth 20 Arcs, Utopia was a very prosperous country; countries all over the world sought to buy her products. Utopian ships carried goods all over the world and money flowed unto Utopia in freights. Also she had great investments abroad, which paid her large sums of money in dividends.

During the period of Utopia's prosperity, merchants and bankers in Arcadia and elsewhere were naturally anxious to get hold of Utos, because it enabled them to buy on favourable terms, in any market in the world. Thus the Uto became a marketable commodity all over the world, and as a result of the haggling of the market, its price became fixed in Arcadia, for round about 20 Arcs for 1 Uto.

As time went on, however, Utopia's prosperity began to decline, and instead of being a creditor, she became a debtor. As their confidence in Utopia declined, the bankers and merchants of Arcadia became less anxious to buy Utos. So it was that the market value of the Uto began to decline until in A.D. 2050 it reached the present value of 9 Arcs, which Arcadians are still willing to give, because they know that a deal with Utopia is still a sufficiently good business proposition to make it worth their while to give 9 Arcs for 1 Uto, though not so good as when they gave 20.

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